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1 LPISQA2012

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FINAL

This is the Table of Contents for the technical documentation for the 2012 implementation of the LPIS quality assessment called for by article 6 of Commission Regulation No 1122/2009.

Chapter "2. Inspection method" and the three "Annexes" have not undergone modifications since 2012-07-02 and can therefore be considered frozen. Changes to these parts will be listed in the "Errata 2012" article. Support pages such as FAQ+Q&A will be updated to improve the support.

- You can make a pdf version of [this chapter 2](#) "on the fly".
- You can also make a pdf version of [all LPIS QA technical documentation](#) "on the fly".

These "on the fly" documents will reflect the content at the time they were created. The history tab provides the date and nature of possible changes.

Changes to the previous version v5.1 are as much as possible indicated by a maroon text colour. Modifications applied after the 2012 LPIS workshop are as much as possible indicated by a green text colour.

1.1 Table of contents

1. Rationale

2. Inspection method

- a. Initial ATS conformance
 - ◆ i. Preparation
 - ◆ ii. Testing
 - ◆ iii. Reporting on ATS conformance
- b. Annual ETS conformance
 - ◆ i. Definitions and principles - *Updated*-
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 - ◆ iii. Reference Parcel Sampling
 - ◆ iiiii. CAPI Inspection
 - ◆ iiiiii. Field inspection and optional field activities - *New* - - *Updated* -
 - ◆ iiiiii. Analysis of observed data
 - ◆ iiiiii. Acceptance decisions - *Updated* -
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 - ◆ i. Non-CwRS image upload/delivery
 - ◆ ii. Non-structured evidence upload/delivery - *New* - - *Updated* -

3. Support

- a. Downloads - *Updated* -
- b. Tools - *Updated* -
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- c. Examples
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 - ◆ i. Sampling: practical considerations
 - ◆ ii. Orthoimagery
 - ◆ iii. Thresholds
 - ◆ iiiii. ISO19157 and ETSv5.2 - *New* -
- f. Frequently Asked Questions - *Updated* -

4. Discussion pages

- a. MS feedback and Q&A on the draft ETSv5.2 - *Updated*-

- [b Findings from the 2012 LPIS WS - Malta - New](#) -

5. Front and back matter

- [a. Abbreviations](#)
- [b. Glossary - Updated](#)-
- [c. Contacts - Updated](#)-
- [d. Release notes - Updated](#)-
- [e. Errata - Updated](#)-

Previous ETS versions

- The 2010 technical documentation is available via [LPIS QA technical documentation v4.3](#)
 - The 2011 technical documentation is available via [LPIS QA technical documentation v5.1](#)
-

2 Rationale 2012

2.1 Challenge

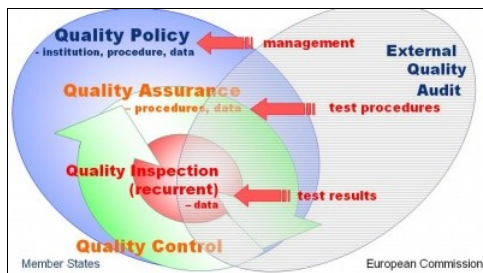
The importance of the LPIS comes from the requirement that it must channel all area based aids; the corresponding financial value exceeds ?40bn for 2012 (see item 05.03 on pages 17-18). For this specific purpose, LPIS quality can roughly be defined as the ability of the system to fulfill two explicit LPIS functions:

1. the unambiguous localisation of all declared agricultural parcels by farmer and inspectors,
2. and the quantification of all eligible area for crosschecks during the administrative controls by the paying agency.

Failure of an LPIS in the unambiguous localisation induces risks for double declaration of land and for ineffective inspections; inadequate quantification of eligible area renders the crosschecks ineffective for preventing and identifying over-declarations by farmers. Both failures involve financial risks for the EU Funds.

Furthermore, any well functioning LPIS will greatly facilitate operations by farmer, inspector and paying agency, resulting in a better overall performance. Obviously, a better LPIS substantially improves IACS effectiveness and management of EU Funds.

2.2 Measures



Both Member States and the EU have therefore a keen interest in demonstrating the quality of the LPIS and in addressing quality issues, if any. Such processes of planned and systematic quality demonstration form the hearth of a quality assurance (QA) system. A QA framework relies on mutually agreed quality testing between ?consumer? (the European Commission) and ?supplier? (the Member State). A test or series of tests assesses compliance for each specified quality requirement.

A distinction is made between ?prime? and ?secondary? quality elements. The prime elements are those that the European Commission considers fundamental for a correct LPIS operation and which are applicable to all LPIS systems. Secondary quality elements might not be applicable for all systems, but may provide additional substantive indications for analysing and remediating issues identified on the prime quality elements.

The [Commission Regulation \(EC\) No 1122/2009](#) calls for an annual reporting on the seven prime quality elements. For each element, one or more measures, holding the inspection procedure a conformance levels has been designed.

A [discussion document](#) elaborates on these LPIS properties and the reasons they are considered essential for a good functioning and proposes a methodology to implement and integrate an adequate quality policy in the regulatory framework.

All prime quality elements have thus been developed into quantitative measures and the test results therefore represent an objective and comparable information on the different LPIS. The main application of this quantitative information is to provide an instrument for achieving business process improvement. Essentially, this quality assurance framework constitutes a yearly check-step within the commonly known plan-do-check-act (PDCA) cycle.

2.3 Implementation

To be practical, the LPIS Quality assurance framework was built using existing components, thus avoiding difficult implementation phases and other risks inherent to any new development. It also enables an easier adoption of the technologies by the Member States, who perform the actual inspection work. The resulting framework combines the following components:

- GI methodology for description of data, inspection procedures and reporting,
- Industry practices and standards for acceptance sampling and decisions
- CwRS data and CAPI know-how as a source for observations of external information
- Current Regulations as instrument for reporting procedures

Go forward to [Inspection method](#) to see the details.

Go backwards to [Table of contents](#).

3 Inspection method 2012

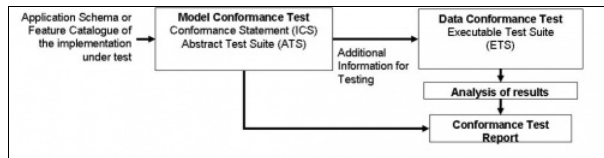
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3.1 The common Inspection method (what should be done and how?)

ISO 19105:2000(E) Geographic information ? Conformance and testing, specifies the framework, concepts and methodology for testing and criteria to be achieved to claim conformance of a data set. A first step of any data conformance testing relates to "managing the requirements".

- The functional requirements of an LPIS are laid down in the Regulations and were translated into the **LPIS Core Model (LCM)**.
- The high-level quality expectations regarding LPIS data are described in a **discussion document**

These two documents form the basis for the two test suites: Model Test Suite (ATS) and Executable Test Suite (ETS), as illustrated by this simplified Conformance assessment process overview



The inspection process involves three activities.

1. **at the start**, produce a Feature Catalogue of the Implementation Under Test (IUT). This defines and clarifies data types and the relationships amongst them.
2. perform an **initial** ATS. The ATS allows for the verification of model conformance of the LPIS implementation under test through a set of dedicated tests.
3. run an ETS **annually** to inspect the continued ability of the LPIS data to unambiguously geographic locate agriculture fields and to quantify the area of eligible land. The ETS operates on measures for the seven prime quality elements.

The 2010 ATS has not undergone any modification for the 2012 assesment. It is therefore not formally required to repeat the second step above. However, the 2010 ETS experience may have indicated some ATS interpretation issues or database model mapping imperfections that affected producing the correct scope or data values for the ETS. It is therefore recommended to consider your ETS analysis and feedback and improve your ATS documents where appropriate.

3.2 ATS, ETS and quantitative spatial data quality elements

ISO 19113:2002(E) establishes the principles for describing the quality of geographic data and specifies components for reporting quality information. It also provides an approach to organizing quantitative information in five *data quality elements*. If one tentatively maps how these five are addressed in either test suite, the results could look like:

The **Model Test Suite**, formerly called Abstract test suite -abbreviated ATS- tests **model conformity**, i.e.

- ◇ **logical consistency**: the degree of adherence to logical rules of data structure, attribution and relationships (compared to the LCM)
- ◇ **completeness**: presence and absence of features, their attributes and relationships

The **LCM ATS** describes the applicable tests to verify whether your LPIS was designed correctly.

Note: Since the documents on the model test suite have not undergone any changes since ETSv5.1, it will still be abbreviated with ATS in this v5.2 documentation set. **PLEASE READ ATS AS "MODEL TEST SUITE" HENCEFORTH**

The **Executable Test Suite (ETS)** manages the inspection of the actual (LPIS) **data values** for:

- ◇ **thematic accuracy**: accuracy of quantitative attributes and the correctness of non-quantitative attributes and of the classifications of features and their relationships.
- ◇ **temporal validity**: validity of data with respect to time
- ◇ **completeness**: presence and absence of features, their attributes and relationships.

in accordance with the instructions and guidelines of the quality framework set in ISO 19114, 19113 and ISO/TS 19138. In ETS v5.2, the measures were edited to comply with the newly approved ISO 19157:2011 standard. The standard introduces a 6th quality element:

- ◇ **usability**: adherence to a specific set of requirements

These ETS activities are performed within three phases:

1. sampling: **Sample pre-selection**
2. inspection: **ETS**
3. reporting: **ETS result analysis**

The Commission Regulation 2010R146 calls for an **annual report** to be produced and delivered to the Commission upon completion of the ATS and ETS inspections. The report allows the MS to convey its findings to the European Commission. It holds a predefined mandatory data and analysis report and an optional remedial action plan.

Go forward to [Initial ATS Conformance Testing](#) to see the details.

Go backwards to [Table of contents](#).

4 Initial model conformance test (ATS) 2012

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4.1 2012 changes

4.1.1 Your LPIS model has not undergone modifications

The 2010 ATS has not undergone any modification for the 2012 assessment. It is therefore not formally required to repeat the second step above. However, the 2010 ETS experience may have indicated some ATS interpretation issues or database model mapping imperfections that affected producing the correct scope or data values for the ETS. Therefore, **it is recommended to consider your ETS analysis and feedback and improve your ATS documents where appropriate**. To this respect, experience from 2010 shows that:

- some parcels should not have been in scope because somewhere an "ineligible flag" was not detected.
- the reference area was not always correctly derived from all information available in the system

4.1.2 Your LPIS model has been revised since last year

Please perform the ATS as described in the following articles to ensure correct ETS scoping and data value mapping.

4.2 Objectives

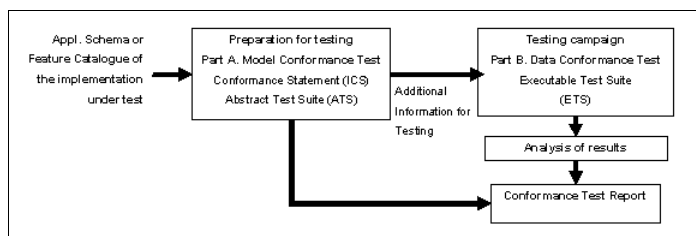
The main aim of the LPIS-ATS is to provide a comprehensive test suite that enables conformity testing of the various LPIS implementations developed to address the common requirements laid down in the CAP regulations EC 2009R73 and EC 2009R1122 and their supporting working documents. The **LPIS Core Conceptual Model (LCM Technical Specification)** has been designed to accommodate these regulatory requirements on the LPIS.

The **Model Test Suite (ATS)** is the set of dedicated tests covering all specific requirements to be satisfied for the conformance of an implementation under test (ISO19105). In general, an **abstract test** is a generalized test for a particular requirement. Abstract tests are independent of the actual implementation values and their positional, temporal or classification accuracy.

An ATS deals with data base structure, logical and conceptual consistency and how the database design is 'fit-for-purpose'. Conformity of the model is a pre-requisite for a meaningful testing of the data values in the ETS.

The **LPIS inspection method** includes a single starting or preparation phase for database testing (see figure below): part A 'Model Conformance Test?', should result in an Implementation Conformance Statement (ICS). This ICS allows the second phase - part B Data Conformance (quality) Test - **Executable Test Suite (ETS)** to start.

A final **Conformance Test Report** draws from both the ATS (part A) and the ETS (part B).



The LPIS inspection methods (elaborated after ISO19105)

4.3 Methodology overview

The ATS procedure has the following three steps:

4.3.1 Step 1: Preparation

A formal description of the LPIS under test should be prepared as an input to the remainder of the test. There are two document options for this task: an Application Schema OR a Feature Catalogue (FC) of the implementation under test

◇ An **Application Schema** is a formal description of implementation under test and the preferred data source for the ATS. According to ISO 19101, an application schema is a conceptual schema for data required for one or more applications (implementation). It specifies the spatial and non-spatial objects 'feature types- within the domain-relevant view of the real world as expressed by the information requirements. It is documented in a conceptual schema language (e.g. UML) or encoding standard as GML. Both representation ways of application schemas ' UML diagrams and GML encoding ' were used for the (**LCM Technical Specification**).

◇ A **Feature Catalogue (FC)** is a formal description of implementation under test and the main data source for the ATS in case no application schema available. According to ISO 19101 it is a catalogue containing definitions and descriptions of the feature types, feature attributes and feature associations occurring in one or more sets of geographic data, together with any feature operations that may be applied.

The **Implementation Conformance Statement (ICS)** is a description of the options, which have been implemented in the LPIS under test. The ICS accompanies the primary data source: application schema and feature catalogue and may, according to the ISO standard be presented in the form of a plain text document or be generated by a structured questionnaire. In the LPIS QA context, the ICS is used as vehicle to compile and exchange the "ETS eligibility profile"

4.3.2 Step 2: Testing

The model test suite is composed of a series of individual abstract tests, each for a particular requirement.

During this **ATS testing**, equivalence with features and attributes of the LCM is established with the help of the schema/FC of the LPIS under test. The implementation under test can have more data sets, features and attributes than the LCM, but only those which are conceptually corresponding to the elements of the LCM shall be tested. Testing can be done by simply comparing the model description (FC) against the LCM technical specification or by application schema mapping. Test findings shall be documented in the **ATS-log** report, one record per each test and then translated into a summary **ATS scoreboard**.

ATS log

The ATS has a hierarchical structure. Tests are combined into the 3 main modules, with the last one subdivided in 3 sub-modules. A conformance statement ?Conforming/nonConforming? shall be assigned to each test and these are to be aggregated at module level. The ATS assigns a LPIS implementation as ?Conforming?, if all modules are ?Conforming?. For the data entry please use the following template: [ATS_template_v3.xls](#), and then build an XML-file according to the following schema: [4_3_AtLog_20110120.xsd](#).

ATS scoreboard

The ATS Scoreboard ([4_3_AtScoreboard_20110120.xsd](#)) represents a summary of the individual modules' ATS-log reports. For each test in the ATS, it shall specify a conformity element that can take one of the following values:

- Conforming (Conforming) - the implementation is fully conforming to the LCM specification.
- Non conforming (NonConforming) - the implementation does not conform to the LCM specification.
- Not evaluated (NotEvaluated) - conformance has not been evaluated.

The ATS Scoreboard differs from the ATS-log report, which contains detailed information on where in the LPIS database elements of the LCM can be found.

4.3.3 Step 3: Reporting

The final ATS reporting package shall hold:

- the ATS-scoreboard
- the eligibility profile (ICS)
- the list of applicable waivers (ICS)
- the ATS-log report

The ATS archiving package stored by the MS administration shall hold:

- the input documentation (application schema OR feature catalogue)
- the Implementation Conformance Statement (ICS) informative textual part as a supportive document (pdf)

Go forward to [Preparation](#)

Go backwards to [Table of contents](#).

5 ATS preparation 2012

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The preparation of the input documentation is probably the most time-consuming step of the ATS. It can trigger several iterations and involves experts dealing with different parts of the IT system.

5.1 Application Schema

How to create data base specification from UML model / application schema?

To create a UML model/application schema, modelling software shall be used (e.g. Enterprise Architect, Altova UModel). This software allows exporting the implementation model/application schema into a database/system specification document. The documentation shall contain:

- the UML diagrams illustrating the overall model and its logical parts,
- the description of each feature type (spatial and non spatial objects)
- a description of feature type properties such as attributes (definitions, data type, allowed values, constrains)
- a description of association dependencies (generalisation, aggregation, composition etc.)

The [LCM Technical Specification](#) is an example of such documentation.

The GML application schema for LPIS Core Model can be downloaded from the ftp: [LPIS Core Model Schema](#).

5.2 Feature Catalogue

How to create a Feature Catalogue?

For a template for Feature Catalogue, the template proposed by the ISO19110 (2003) standard can be used: [template_FC](#)

This template of the feature catalogue retains the original structure of the ISO standard. However, for the sake of clarity and discussion, additional, 'Non-ISO' ancillary information is included for feature types and feature attributes by means of additional fields that are specific to the LPIS Core Model (LCM). These specific entries are

- LCM_discussion: clarification of the definition.
- LCM_example: exemplary values from a MS implementation (not necessarily a 'best practice' example)
- LCM_reference: reference to the Regulation
- LCM_comment: various comments

The first worksheet of the template contains two tables: FC metadata and FC summary. The FC metadata table contains information necessary for FC identification (name, scope, responsible organisation /person etc) . The table FC summary contains information on content of the catalogue:

- feature types (usually corresponds to spatial or non spatial data set/layer/table);
- the classification of feature types such as core data ?for determination of area of reference parcel-; data for SMR or GAEC; spatial data on rural development; cartographic reference, etc..
- geometry types - such as polygon, line, point, buffer, no geometry (for tables)
- source types - such as maintained by LPIS custodian, external - integrated into LPIS from different sources, shared - on-line link/harvesting/web service to other system(s).

For each feature type in the catalogue you will need to create one separate worksheet! Feature_name X should correspond to the name of the .xls speardsheet where the feature is documented in the FC; The list of the features in the metadata FC_summary table shall corresponds to number and names of features described in catalogue.

The feature worksheet contains two types of tables: one for describing the every feature, another table for describing attribute(s) -one table per attribute. The entries of the attributes in the feature table shall correspond to the names and number of attribute tables. The template_FC contains one prefilled example of a feature worksheet.

5.3 Implementation Conformance Statement

The ICS is a supportive document and is to be provided by the authority claiming conformance with the LCM. This statement involves a mandatory and informative part:

- mandatory, structured part
 - ◇ ?eligibility profile? ? conversion table allowing raw ETS observations (mapped land cover features) to be expressed in eligibility terms (see also [ETS annex III, table 2](#));
 - ◇ List of applicable waivers, which can vindicate the "contamination" of the Reference parcel with certain non-eligible features (described in Annex I);
- informative, textual part (non-exclusive list):
 - ◇ type of payment scheme (SPS/SAPS) and presence of other CNDP schemas and coupled payments (title IV);
 - ◇ type of Reference Parcel, including national definition translated in to English, history of LPIS system development and upgrades, evolution of parcel definition and reason for changing of type of reference parcel (if applicable);
 - ◇ rules for producing the Reference Parcel identifier;
 - ◇ coordinate reference system(s) (CRS) used for LPIS/ reference parcel layer

- ◇ flowcharts for operations;
- ◇ findings of recent audit and mitigation actions, etc.

Go forward to [ATS Testing](#)

Go backwards to [Table of contents](#).

6 ATS testing 2012

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During ATS **testing** equivalence of features and attributes of the LCM shall be established in the schema/FC of the LPIS under test. The implementation under test can have more data sets, features and attributes than the LCM, but only those which are conceptually corresponding to the elements of the LCM shall be tested. Testing can be done by simply comparing of the member state model description with the LCM technical specification or by application schema mapping. Tests' findings shall be documented in the **ATS-log** report, one record per each test.

6.1 ATS log

Use the following template for data entry: [ATS_template_v3.xls](#),

Module A_11

- Define the type of Reference Parcel in use. It requires the exhaustive definition of the reference parcel with all possible options, given in native language AND translated in English.
- Assign 'Conforming?' to module A_11 if one and only one of the tests A_1113; A_1114; A_1115; A_1122; A_1123 is 'Conforming'.

Modules A_12 and A_13

- Analyse the attributes of the reference parcel.
- Assign 'Conforming?' for each test result of the modules A_12 and A_13 if for each element of the LCM, a corresponding feature from the LPIS under testing is found with:

◇ **data set / table**

◇ **layer**

◇ **attribute**

◇ **format**

◇ **value**

◇ **definition (Eng.)** 'feature type definition translated in English, in order to prove semantic equivalence to the element in the LCM.

- Store the records for all tests findings (data set name/attribute name, format, values and definition) in the ATS-log report [ATS_template_v3.xls](#). If needed, additional description can be added in the column behind definition column.

6.2 ATS scoreboard

Build an XML-file according to the following schema: [4_3_AtsScoreboard_20110120.xsd](#) based on ATS-log results.

6.2.1 Aggregation of results at the modules level

- Assign Module A_11 'Conforming?' if one of the tests A_1113 **OR** A_1114 **OR** A_1115 **OR** A_1122 **OR** A_1123 is 'Conforming' **AND** A_113 are 'Conforming?'
- Assign Module A_12 'Conforming?' if test ALL applicable tests (not optional) are 'Conforming'
- Assign Module A_13 'Conforming?' if sub-module A_131 is conforming **AND** sub-module A_132 is conforming **AND** sub-module A_133 is conforming:

◇ Sub-Module A_131 is conforming if ALL tests are 'Conforming'

◇ Sub-Module A_132 is conforming if ALL tests are 'Conforming'

◇ Sub-Module A_133 is conforming if ALL tests are 'Conforming'

6.2.2 Aggregation of results at the LPIS level

Fill in 'Conclusions' section of the ATS-scoreboard report:

- state that 'All modules are 'Conforming?>' if it all the modules passed tests successfully **OR**
- indicate all module(s) which are NonConforming, and explain the (likely) reason for the non-conformance(s), whether an alternative solution does/doesn't exist, and if the existing implementation is appropriate/ not appropriate to enable further testing (within the ETS). Finally, mitigation measures in order to deal with the observed non-conformance may be proposed here.

6.3 ICS structured part

6.3.1 Eligibility profile

Follow the instruction of [ANNEX III: The concept of land cover and 'eligible hectares'](#) to prepare the eligibility profile, relevant for the agriculture land cover types presented in the LIPS. The template for this eligibility profile is presented at the end of the document (Table 3), and can be retrieved as an XSD scheme from our FTP: [5_1_EligibilityProfile_20111027.xsd](#).

The use of a correct and complete eligibility profile in the ETS is critical for expressing raw ETS observations (mapped land cover features) in eligibility terms.

- ◇ Complete the eligibility profile table and add this to the ATS report
- ◇ Use this eligibility profile for the ETS inspection.

6.3.2 List of applicable waivers

For waivers on contamination, look up the **Detailed Instructions 2** at the end of [ANNEX I: Quality Measures](#). It contains a list of three waivers [A, C and D].

- ◇ Add waiver C to the list when there is a separate GIS layer to determine (in)eligibility, e.g. as indicated in ATS test A123, or on other documentation
- ◇ Add waiver D to the list when there is a separate GIS layer to delineate historical GAC, as indicated in ATS test 122

Waiver A is applicable to all systems and require no explicit listing.

6.4 ICS optional textual part

The optional textual describes the various options that are relevant for a better understanding of the LPIS under test.

There are no formal guidelines or templates for the layout and content of this textual part. The textual part shall be produced in Adobe pdf format.

Go forward to [ATS Reporting](#)

Go backwards to [Table of contents](#).

7 ATS reporting 2012

[version 5.2](#)

7.1 Purpose of the report

The ATS shall be performed at the initial phase of preparation of the annual quality assessment (ETS). The ETS is an annual procedure, but the ATS isn't. There is no need to repeat the ATS testing every year, unless there were database structural changes or LCM upgrades (respectively from re-designing the LPIS or changes to the EU requirements).

In the annual LPIS assessment report, it should be mentioned when the last ATS was done and what was the conformance statement.

7.2 Data part

The ATS reporting that is necessary can be divided in two packages: the ATS reporting package that should be sent to the EU and the ATS archiving package, which is to be stored by the member state.

An example for all the files that should be provided in the different packages can be found on the: [LPIS QA download page](#) .

7.2.1 ATS reporting package

The ATS reporting package, to be sent to the European Commission shall consist of:

1. ATS-scoreboard (xml) (XML: [4_3_AtsScoreboard_20110120.xsd](#))
2. Eligibility profile (xml) (Implementation Conformance Statement structured part) (XML: [5_1_EligibilityProfile_20111027.xsd](#))
3. List of applicable waivers (xml) (Implementation Conformance Statement structured part) (XML: [5_1_Waivers_20111027.xsd](#))
4. the ATS-log report (xml) (XML: [4_3_AtsLog_20110120.xsd](#))

7.2.2 ATS archiving package

The ATS archive package, to be stored by the Member State shall hold:

1. the input documentation (application schema OR feature catalogue)
2. the Implementation Conformance Statement (ICS) informative textual part as a supportive document (pdf)

7.2.3 Note

All elements of the ETS reporting package can be easily exchanged with the help of technical templates. These templates are available from the [LPIS QA download page](#)

7.3 Delivery instructions

ATS reporting package shall be uploaded on the LPIS QA portal.

For instruction, please refer to [Use case: Uploading ATS Reporting Package](#)

Go forward to [Annual ETS inspection](#)

Go backwards to [Table of contents](#).

8 ETS conformance 2012

version 5.2

8.1 Objectives

The core objective of the ETS is to collect the necessary and sufficient information, in order to assess the ability of the LPIS to effectively perform its tasks. This is done through direct observation and analysis of a sample of the registered LPIS parcels against current year's terrain information.

In this respect, the ETS is targeting, by a qualitative and quantitative inspection process, those key characteristics on the LPIS objects (and their properties), which could provide a verdict on the ability of the LPIS:

- ◊ to enable the unambiguous geographic location of agriculture fields, claimed for aid by the farmer (identification and position of agriculture parcels)
- ◊ to quantify the area of eligible land at a parcel level in order to cap any undue payments and to inform the farmer on the land available for claim

Each of these key characteristics, called "prime quality elements", is assessed on the base of a specific set of measures, initially defined according to the quality framework set by ISO/TS 19138 and further adapted in compliance with ISO 19157. The detailed description of the measures is given in [ANNEX I: LPIS data quality measures](#).

8.2 Methodology

The ETS comprises three key phases:

1. **Preparation of the reference ground data and Sampling** - Identification of the areas for inspection (on the base of the ground data available) and follow-up sampling of the reference parcels inside these areas, based on ISO2859-2
2. **Parcel Inspection** - inspection of the selected reference parcels (following the list of pre-defined quality measures), against current year's ground data
3. **Analysis of observed data** - subsequent processing and analysis of the observations made during the inspection and aggregation of the results.

The elaboration of the ETS package was based on some principle assumptions and considerations, outlined in the Chapter **Methodological background**.

Each quality measure, implies a specific sequence of observations, which have to be made for every reference parcel inspected. These observations are collected through a land cover interpretation and delineation of the area represented by the reference parcels, either by computer-assisted photointerpretation (CAPI) of current year's orthoimagery ([1st approach](#)) or by direct field measurements ([2nd approach](#)). This second approach is implemented through a survey instruction, alternative to the first approach's CAPI inspection. No optimised workflow has yet been designed .

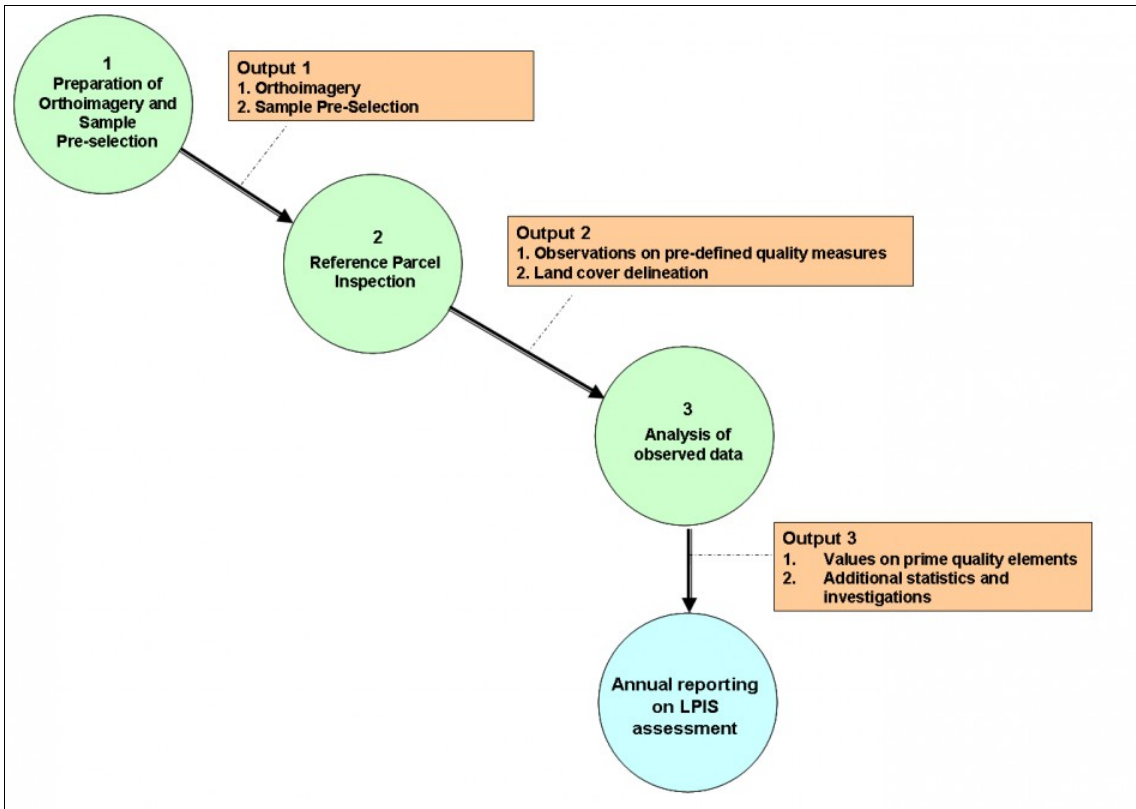
If performed in the office ? the reference parcels are not inspected on the field ? the ETS inspection requires the setting-up of appropriate GIS environment and the availability of two principle input datasets:

- the sample reference parcel data and
- an up-to-date reference orthoimagery, compliant with the relevant LPIS specifications.

The EU Member State Administration could use any available orthoimagery in the country, if acquired in the year of the inspection. Alternatively, the Commission can provide very-high resolution (VHR) satellite data, acquired in the frame of the CwRS campaign, considering that the CwRS cycle provides a well-established frame for image capture and time schedule. CwRS imagery must be processed in a way to meet both the LPIS QA and CwRS requirements. Upon request, a limited number of dedicated LPIS QA zones can be acquired within this framework.

As most of the process is related to photointerpretation and land cover delineation, certain general mapping rules are defined in advance, but they are not too restrictive in order to give some flexibility to the inspectors to adjust to their particular LPIS design and local environment.

A country specific "[eligibility profile](#)" is applied to the land cover features recorded in order to correctly separate the eligible from ineligible land cover. The eligibility profile constitutes a conversion table allowing raw ETS observations (mapped land cover features) to be expressed in eligibility terms. The observations' database is then cross-checked and processed against the eligibility profile, and the relevant statistics and analyses are generated through simple SQL statements. These yield the scores for each "prime" quality element for the LPIS under test. An overview of the ETS workflow is given on the diagram below.



Overview diagram of the ETS workflow

Go forward to [Definitions and Principles](#).

Go backwards to [Table of contents](#).

9 Definitions and principles 2012

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This methodological section introduces the key concepts behind the ETS documentation, as well as the two fundamental principles that drove the development of this ETS.

9.1 LPIS

9.1.1 Definition

There is no explicit LPIS definition in the Regulations. However, there is a clear requirement that a LPIS holds:

1. a stable identification of land cover and/or use units (i.e. the basis for eligibility for any scheme);
2. the 'eligible hectares' value for area aids, originally delineated (vectorised) by survey compatible with 1:10,000 scale or better, and subsequently updated by the various IACS processes;
3. an inventory of other features that benefit (or preclude the right) from aid, with eligibility (and value) depending on the other aid schemes: this is a database of polygons, lines or even points, that permit (spatial and alphanumeric) queries and data retrieval operations in function of the administrative cross checks required.

Considering the INSPIRE conceptual frameworks on Geographic Information in Europe, we propose to merge these requirement into one definition:

LPIS is the single GIS for IACS

9.1.2 LPIS QA Scope

For the LPIS QA, under Regulation No 1122/2009, only the first pillar of IACS is currently considered, indicated by the first two requirements. In particular any reference parcel that is mentioned on the farmer's application shall be subject to inspection. This translates to reference parcels that:

- OR
- ◇ were declared during the previous application year for 1st pillar support
 - ◇ hold a non-zero 'maximum eligible area' ; i.e. can appear on the pre-printed form or re-enter an application for 1st pillar support without triggering an additional verification procedure.

The 'scope of the LPIS QA', does NOT include:

- ◇ Reference parcel with zero MEA but declared exclusively for "other uses".
- ◇ Reference Parcels holding agriculture land, but not eligible for direct aids as their size is below the minimum threshold

9.1.2.1 DQ_scopes

The inspection ground situation and some historic conditions can restrict what can be observed on a sampled reference parcel during inspection.

1. if image acquisition parameters are not compatible with image quality recommendation, all parcels in that zone can be **discarded**
2. if local technical image conditions prevent a clear inspection, an affected parcel can be **skipped** (for reason of cloud cover)
3. some local cropping conditions may prevent that a particular parcel is delineated and some data acquisitions methods and historical constraints can make it nonsensical to compare the ETS observed value individually to the recorded value. The ETS methodology will flag such parcels and use these flags to determine which measures are relevant and which not for the particular parcel. The **DQ_scopes** of the ETS data quality measures filter out these flags to ensure a maximum of relevant information is extracted from the sample.

9.1.2.2 Considerations on your given LPIS implementation

The LPIS QA scope restricts the LPIS population for the purpose of this LPIS quality assessment to ONLY those reference parcels that comply with one of the two conditions above.

1. This is not necessarily the complete set of "blocks" that are managed in the "LPIS-layer" of the GIS-environment. It can be a subset, for instance, 'blocks' that are completely urban, water or forested AND that have not been declared by farmers should not be subject for quality testing. Non-agriculture blocks should not be considered when constructing the "lot of reference parcels" (defined below) for this ETS.
2. Not all individual blocks/polygons in a system necessarily represent a single reference parcel
 1. individual landscape features can often be considered as an element of one and only one reference parcel
 2. some production blocks may have been subdivided to detail their content (e.g detailed land cover categories or cropping patterns).

It's strongly recommended to merge, where appropriate, such subdivisions into a single RP polygon to reflect the true reference parcel FOR THE purpose of the LPIS QA.

9.2 Other Key Definitions

For the clarity of further readings, the following basic sampling scheme terms are introduced and explained below for use in the ETS:

- **Lot of reference parcels:** a homogeneous^[1] population of reference parcels defined for each country/region (or LPIS).
- **Sample size:** the prescribed number of reference parcels to be tested by the EU Member State, based on ISO 2859/2-1985 (Procedure A, Limiting Quality = 2%),
- **Sample pre-selection:** an ordered list of reference parcels (provided by JRC) to be sequentially inspected. The pre-selection counts roughly three times the prescribed sample size.

- **LPIS Control Zone:** zone used for the ETS parcel inspection, where up-to-date national orthophoto or VHR data, acquired in the frame of the CwRS or independently, is available and considered random with respect of the underlying parcels.
 - ◊ **Proprietary Zone:** zone used for the ETS parcel inspection where a national orthophoto or VHR data independently acquired is planned/available.
 - ◊ **CID Zone:** zone used for the ETS parcel inspection where VHR data, acquired by JRC in the frame of the CwRS or dedicated LPIS is planned/available.

1. ? Assessing whether the RP population to be inspected is homogenous and thus constitute a single "sampling lot" relates only to the processes of RP creation and RP upkeep of the reference parcels.

9.3 Principle 1: the sampling plan entails the decision on the quality

ISO2859-2, procedure A is selected as an appropriate sampling plan, offering a cost-effective compromise between the costs of inspection and the probability to come to a correct verdict on the quality.

The plan's probability performance is so that a LPIS with a marginal better quality than the required minimum still has around 5 % probability of been considered too poor, and a LPIS slightly worse than required, has around 10 % probability of being considered adequate. The precise probabilities are indicated in the standard. Better performance on the verdict would require more sampling and thus more resources.

An acceptance sampling plan is a set of rules by which a lot is to be inspected and 'sentenced'. In practice, it determines the sample size in function of the lot (LPIS) size and specifies the lot conformance based on the observed number of non-conforming items (parcels). In other words, given a minimum requirement for a specification, the plan will identify

- ◊ The sample size (the number of parcels to be inspected)
- ◊ The acceptance number (the maximum number of non-conforming parcels that are likely to be found in an acceptable lot)

The key elements and operating instructions of the selected sampling plan can be found in the section on the [acceptance decisions](#)

9.4 Principle 2: observations of agriculture land and eligibility for the scheme are distinct

LPIS is the spatial database (GIS) within IACS; its 2 prime functions are

1. a stable identification of the land use - the basis for aid application in any scheme -
2. the correct quantification of the agriculture land (cover) within; - the "cap" for crosschecks in the direct aid scheme -

Contrary to first impressions, eligibility of land for direct aid is not consistent over Europe:

- ◊ SPS and SAPS differ: e.g. on household garden, on GAEC conditions;
- ◊ Landscape features are eligible depending on national GAEC rules within a scheme.

It is therefore not feasible to develop a common pan-european inspection procedure that directly assesses eligibility. The workaround is to perform the inspection in two steps:

1. observe and measure the features on the land
2. assign eligibility to those features based on the local eligibility profile.

Further details and instructions on the land cover mapping are provided in [ANNEX III](#):

Go forward to [Control zone and reference orthoimagery selection](#).

Go backwards to [Table of contents](#).

10 Control zone and imagery selection 2012

version 5.2

This section describes the procedures for the definition and selection of the geographical zones in a given LPIS where the reference parcels are subject of inspection. It also outlines the specifications of the orthoimagery, suitable for the reference parcel inspection.

A correct and complete application of the sampling and inspection methodology is crucial to support a general trust in its findings.

10.1 LPIS control zone selection

- Analyse whether the LPIS under test can be considered as a single "lot", or whether it should be subdivided into several "lots" on the basis of different production processes implemented during the creation of specific parts of the LPIS.
- If the LPIS under test cannot be considered as a single "lot", decide on the number of "lots"
- For each "lot of reference parcels", randomly define geographic control zones, according to the following principles:
 - ◆ the number, position and area of the zones should ensure that the total number of reference parcels inside is at least 3 times the "Sample size" requested
 - ◆ they are covered by a current year's orthophoto suitable for LPIS update or are planned to be covered by such orthophoto well in time for this year's LPIS assessment.

When no such orthophoto is available or planned for the zones, a timely acquisition request for VHR satellite data in the frame the CwRS programme can be considered.

In all cases, to guarantee a representative inspection, the external data should be independent of LPIS creation and already performed maintenance processes. In this respect the Member State should ensure that the definition of the LPIS control zones, is independent from the LPIS status and properties, as well from any reference parcel characteristics. We repeat this is an important condition for considering those zones as randomly selected for the LPIS assessment.

In this respect, a particular attention should be paid to LPIS control zones, acquired with aerial imagery, as the planning of the aerial orthophoto can be often linked with a dedicated refresh of problematic or updated parts of the LPIS. The use of zones that are part of the CwRS programme for the LPIS QA is not considered a problem, as the CwRS zone are assumed by default to be independent from the LPIS-related issues and risks. MS Administrations not participating in the CwRS programme of the EC can order specific acquisitions for the LPIS assessment through the EC services. By default, they will have the responsibility to process/orthorectify the VHR data. The procedure of the raw VHR image ordering and delivery will be discussed and agreed with each MS Administration, bilaterally.

Once defined and selected by the EU MS, the resulting zones should be reported to the EC, as the "LPIS control zones" for the year of the assessment. The MS Administration should provide the geographic position and extend of the "LPIS control zones" in the appropriate geodata format with the official EPSG identification or the parameters of the coordinate reference system applied.

The LPIS control zone can be changed during the inspection campaign, only if:

1. JRC has used the full LPIS population to produce the new sample pre-selection.
2. Timely availability of suitable imagery for the alternative zones can be guaranteed.

More information on zone definition for the CwRS programme can be found on: [Zone Definition for the CwRS campaign](#)

10.2 Considerations regarding the orthoimage specifications

10.2.1 Ground Sampling Distance - Spatial Resolution

As stated in Art. 17 from COUNCIL REGULATION (EC) No 73/2009, the minimum scale for the cartographic information used to create and update the LPIS is 1:10 000, which corresponds to an orthoimagery of at least **1 meter** spatial resolution. The specifications of any VHR data used in the CwRS programme is compliant with the cartographic standard of 1:10 000. However, the surveys done by JRC last years, indicated that the EU MS Administrations use for the LPIS maintenance, orthoimagery with a superior spatial resolution. Most of the EU countries, rely on orthoimages with ground sampling distance (GSD) of 50 cm or less, thus resulting in cartographic scale of about 1:5 000 or larger for the spatial data recorded in the LPIS.

10.2.2 View angle

The findings of the recent [ETS pilot study](#) indicate that, under some field conditions, the ETS parcel inspection could be less than optimal when the imagery is acquired with significant off-nadir angle (more than 30-32 degrees), independent from its spatial resolution. This is because oblique acquisition results in larger ground sampling distances and also increases the probability of occlusions of the land under inspection, caused by tall features (buildings, hedges, forest belts, tree lines, etc.). The increase of the GSD results in lower spatial resolution of the final orthoimagery.

10.2.3 Mapping Unit Size

The ETS inspections methodology requires mapping of individual land cover features such as landscape features, with higher level of detail in comparison to the area-based measurements for the CwRS programme (which is often limited to re-check of the area of the agricultural parcels, determined at crop group level). Smaller mapping units require a smaller ground sampling distance.

Furthermore, mapping this variety of land cover features requires multispectral imagery.

A theoretical study on the effects of Ground Sampling Distance and polygons size on the inspection precision can be found in [this presentation](#)

10.2.4 Practical considerations

To address these considerations, please consider the following recommendations, regarding the orthoimagery, **applied in the ETS of the LPIS assessment**:

1. pay attention when using LPIS control zones, covered with orthoimagery, acquired with off-nadir angles of more than **30 degrees**. Depending on the landscape and reference parcel structure and if justified, you might decide to skip the use of such zones, prior to the ETS inspection.
2. use orthoimagery with spatial resolution **better than 1 meter**.
3. use the full spectral range of the imagery. If infrared channels are available, they should be used. Often, the proper land cover delineation for the ETS inspection requires the full use of the spectral information
4. consider the acquisition date. As no crop identification is required, LPIS QA imagery could allow for much larger acquisition windows than CwRS imagery. Still, the date has an impact on the interpretation. Each MS should assess this aspect for its observations and decisions.
5. consider consulting any available ancillary images or vector data, such as aerial orthophoto, acquired in the year under assessment, or supplementary HR data from the CwRS campaign.
6. as with any photointepretation, consider a rapid field inspection if the available information in the office is not conclusive.
7. consider your LPIS population under the zone: it goes without saying that smaller parcels are more precisely measured with higher spatial resolution imagery.

10.2.5 Recommended CwRS VHR imagery

In the light of above-given requirement and taking into account the available VHR satellite, used in the CwRS, the following VHR satellites and configurations are considered suitable for the 2012 LPIS QA:

- Sensors:

- ◊ **GeoEye-1**
- ◊ **Worldview-2**
- ◊ **Quickbird**

- View angle

The table below give the recommended range for the off-nadir/elevation angles for each of the sensors listed above.

Satellite (Sensor)	Recommended Maximum off-nadir angle (in degrees)	Recommended Minimum elevation angle (in degrees)	Comments
QUICKBIRD	25	63	restricted off-nadir angle ensuring a maximum GSD of 0.72m
GEOEYE-1	30	56	-
WORLDVIEW-2	30	56	-

- Use of the VHR data, acquired for 2012 CwRS. Skipping of zones.

- ◊ All CwRS zones, acquired by any of the sensors suitable for 2012 LPIS QA, are considered valid for the 2012 ETS, providing that the principle of randomness is respected.
- ◊ The CwRS zones, acquired by enhanced IKONOS can be exceptionally used for the 2012 ETS, providing that all of the following conditions are met:
 1. There are CwRS zones in the LPIS ?lot?, that are already programmed and acquired by enhanced IKONOS with elevation angle more than 61 degrees.
 2. There are not enough CwRS zones in the LPIS ?lot?, acquired by the spaceborne sensors suitable for LPIS QA, to ensure the number of pre-selected parcels and to guarantee the randomness of the parcel selection.
 3. There are no ?coincidental? suitable archive VHR data available, acquired by the spaceborne sensors suitable for LPIS QA over the CwRS zones, or over other areas that could become alternative LPIS control zones.
 4. There is no any suitable proprietary aerial or satellite orthoimagery, acquired and produced in the assessment year over the CwRS zones, or over other areas that could become alternative LPIS control zones.
- ◊ In addition, CwRS zones, acquired by enhanced IKONOS, should also be used when the practical considerations above have not given any counter-indication against their use. Typically this is the case of large homogenous fields with few vertical features within a level landscape.

10.3 Notes

The above-mentioned recommendations are relevant for the ETS parcel inspection **ONLY**, and not in general for the orthoimagery used in the LPIS update.

The specification of the orthoimagery for LPIS update should be consistent with the following two articles:

- **Specification of the orthoimagery use for the LPIS**
- **Common Technical Specifications for the 2012 CwRS Campaign**

Go forward to [Reference Parcel Sampling](#).

Go backwards to [Table of contents](#).

11 Reference parcel sampling 2012

version 5.2

This section describes the procedure for the generation of a random sample of reference parcels from an LPIS under test. This sample is to be inspected in the ETS ([Executable Test Suite](#)). In order to receive a sample pre-selection Member States:

- shall do **Steps 1 to Step 4**;
- shall download the sample pre-selection list in **Step 9**.

11.1 Data exchange and sampling instructions

Creating the sample pre-selection requires:

- **Step 1** (by MS): create a point representation from the reference parcel polygons (total population of parcels from the Lot);
- **Step 2** (by MS): convert reference parcels' point data into a harmonised data structure: [LpisPointZeroState.xsd](#),
- **Step 3** (by MS): prepare LPIS Control Zones data: [ApplicableCidZones.xsd \(XML\)](#) and [ApplicableProprietaryZones.xsd \(GML\)](#)
- **Step 4** (by MS): upload the PointZeroState, ApplicableCidZones and ApplicableProprietaryZones (if necessary) through the LPIS QA Web Application. For instructions, go to:

- [Logging into the LPIS QA Web Application](#)
- [Establishing LPIS Settings](#)
- [Creating a sample pre-selection](#)

- Step 5 (by EC): receive and analyse reference parcel data and LPIS Control Zones data (**by EC**),
- Step 6 (by EC): clip reference parcel data with the LPIS Control Zones,
- Step 7 (by EC): determine the sample size for the ETS inspection, based ISO 2859/2-1985, procedure A,
- Step 8 (by EC): generate a sequential list of randomly selected reference parcels, and send a notification e-mail,
- **Step 9** (by MS): download the pre-selection list [LpisSamplePreselection.xsd](#). For instruction go to:

- [Logging into the LPIS QA Web Application](#)
- [Downloading a sample pre-selection](#)

This methodology is presented in Figure 1, below.

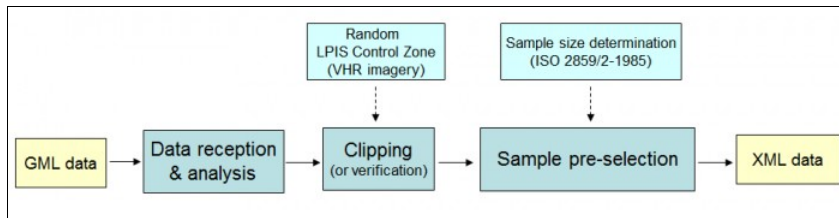


Figure 1. Workflow of the ETS sampling methodology.

Go forward to [Inspection](#)

Go backwards to [Table of contents](#).

12 ETS inspection 2012

version 5.2

12.1 Introduction

This section describes the sequence of actions (events), which has to be performed during the inspection of the reference parcels from the pre-selection set.

12.2 Prerequisites

In order to guarantee the successful conduction of the inspection procedures, the following prerequisites have to be met and verified:

- The ATS of the LPIS data model should be performed in advance and yielded a "Conforming" statement.
- The national or region-specific "eligibility profile" must be prepared and available
- The sampled LPIS data should be readable and complete, together with any relevant ancillary data (ex. historical GAC mask, evidence of farmer-s updates, historical evidences,...)
- The reference orthoimagery should be readable and should be compliant with the relevant [technical specifications](#)
- Both datasets, as well as any ancillary data should be in the same national coordinate reference system
- The proper GIS environment must be available

Member States shall verify that the above prerequisites are met.

12.3 Initial acceptance of the orthoimage for ETS

The ETS operator should conduct basic checks of the orthoimage properties and parameters prior to ETS inspection in order to ensure that the minimum required information content, corresponding to 1/5,000 scale is available (LPIS QA inspection is performed at that scale or better). A list of checkpoints helps to verify whether an orthoimage is suitable for ETS. The detailed description is given in Chapter 1 of Annex II. Please note that these prior image checks are not technically considered part of the ETS quality measures as they do not relate to LPIS data but only determine the usability of the reference orthoimage data set in the subsequent ETS procedure.

12.4 Inspection Workflow

The ETS inspection procedure - quality measures, flow of actions, decision rules - is explained in detail in three downloadable Annexes, which represent the truly technical documentation of the Executable Test Suite of the LPIS QA. Reference to these documents is given at the end of the current page.

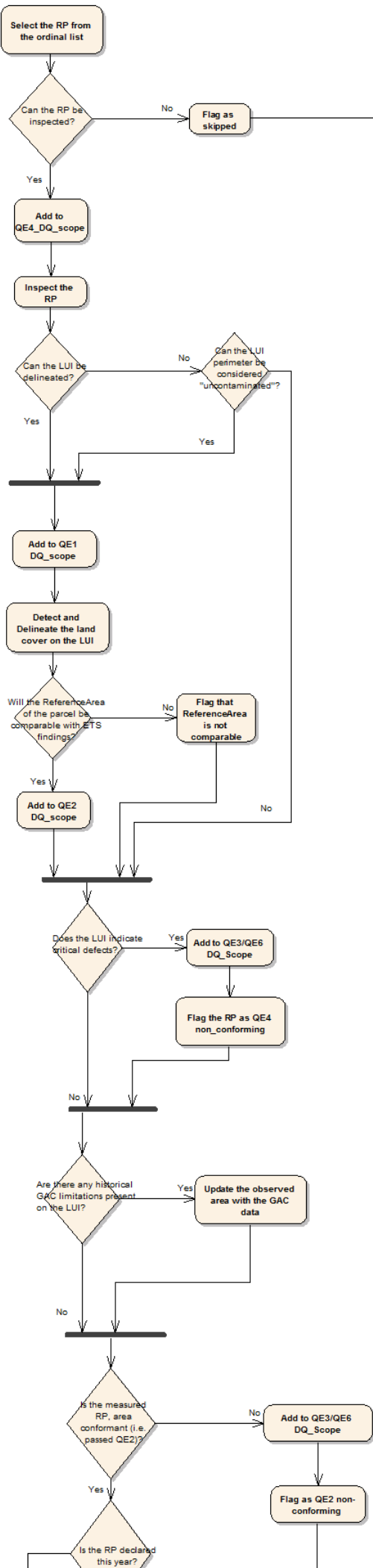
This article introduces the procedure at generic level; i.e. how an individual parcel will be inspected based on the technical, local and historical conditions.

The ETS comprises a sequence of actions applied for each reference parcels under inspection. The set of actions might differ for each reference parcel, depending on the selection rules that govern the sections of the workflow. Each selection depends on the local ground conditions observed on the orthoimage, taking into account also the particular RP design. The selection steps are of great importance, not only because they "outline" the correct inspection path of each RP, they also help to identify those quality measures at sample level (quality elements), the RP will be subject to. This approach ensures that each LPIS quality element will be tested/evaluated with the most appropriate scope of RP (DQ_Scope), based on characteristics in respect to their processing abilities in the ETS.

The ETS inspection "picks-up" and process sequentially the RPs from the sample pre-selection list, according to their ordinal number. **The inspection cycle (loop) continues until the number of the RP inspected reaches the number required for the DQ_Scope of Quality element 4 (Critical Defects).**

The diagram shown below, illustrates schematically the entire inspection process, highlighting the main actions, DQ_Scopes and selection rules.

ad Simple_Flow_Events



12.5 ETS parcel inspection

- Select the top reference parcel RP (from the ordinal list)
- Check if the RP can be inspected on the base of the available input data (LPIS vector dataset, information available from the reference orthoimagery and ancillary data)
 - ◊ If no, flag it as skipped for inspection and go to the next RP
 - ◊ If yes:
 - Add it to the scope of RPs that has to be checked for Quality Element 4 (Critical Defects)
 - Start the inspection of the RP
- Check, if the RP can be measured (the Land under Inspection - LUI - is identifiable).
 - ◊ If no, check if the LUI perimeter is contaminated with ineligible features
 - If yes, skip the measurement of the RP and check it for Critical Defects only
 - Else, proceed with the measurement of the RP
- Add it to the scope of RPs that has to be checked for Quality Element 1 (Total eligible area)
- Make an inventory of the land cover on the LUI through mapping. Derive the maximum eligible area as observed.
- Check if the ReferenceArea of the parcel is comparable with ETS findings.
 - ◊ If yes, add it to the scope of RPs that has to be checked for Quality Element 2 (Area-based conformity)
 - ◊ else: flag it as non-comparable.
- Check if the LUI indicates presence of critical defects.
 - ◊ If yes:
 - Add it to the scope of RPs that has to be checked for Quality Element 3 (Causes for non-conformity) and Quality element 6 (Cumulative land changes)
 - Flag it as non-conformant in respect to QE4
- Update the observed area with the historical GAC data, if applicable
- Check if the measured RP is area conformant (i.e. passed QE2).
 - ◊ If no:
 - Add it to the scope of RPs that has to be checked for Quality Element 3 (Causes for non-conformity) and Quality element 6 (Cumulative land changes)
 - Flag it as non-conforming in respect to QE2
 - ◊ Else:
 - Check if the RP was declared in the year under assessment
 - If yes, add it to the Scope of RPs that has to be checked for Quality Element 5 (Area Declared)
- Check if the RP is part of an application under the OTSC sample
 - ◊ If yes, add it to the scope of RPs that has to be checked for Quality Element 7 (Rate of irregularities)
- Finalize the inspection and go to the next RP from the ordinal list.

A fictitious illustration of the resulting subsets from this procedure is provided in [our 2011 FAQ pages](#)

12.6 Ex-post verification of the ETS inspection (four-eye control)

An independent operator (different from the one involved in the ETS) should verify and confirm the ETS observations for all Reference Parcels belonging to the QC sample. This verification should be made in the same inspection environment as the ETS-inspection and use the same independent standard dataset (reference orthoimagery). A detailed description of this verification is given in Chapter 3 of Annex II.

12.7 Technical documentation on ETS

The detailed description of the ETS inspection procedure is organized in 3 different parts (documents), which are published as three separate annexes in pdf format.

ANNEX I: LPIS data quality measures contains the definition and comprehensive description of the quality units (quality measures applied in a particular quality scope) of the LPIS data, which provide the necessary and sufficient information to properly evaluate the performance of a given LPIS. They were initially defined on the base of the principles and templates of ISO/TS 19138 and were further adapted in compliance with the recent ISO 19157 standard. There are two group of quality units, stated in the document:

- quality units at reference parcel level (with prefix RP_ in the Alias Name) - they are subject of the ETS parcel inspection
- quality units at sample level (with prefix LPIS_ in the Alias Name) - they are derived from statistics from the "RP_" units, through pre-defined SQL statements on the set of observations made during the ETS inspection. Some quality units involve statistics from non-ETS sources.

ANNEX II: ETS inspection procedure ? Description of the workflow contains more detailed and comprehensive description of the ETS parcel inspection workflow, given above. The operator's steps and events are grouped into Action Packages, following the structure of an UML Activity Diagram, developed to visualize the sequence of the process from business use case point of view.

ANNEX III: The concept of land cover and ?eligible hectares" describes the concept of the land cover mapping used in the ETS and the way to express the raw ETS observations (mapped land cover and landscape features) in eligibility terms, using an eligibility profile to perform the conversion. A brief introduction of the FAO Land Cover Classification System (LCCS), used in the semantic description of the agriculture land cover, that might represent

eligible land, is also given. A template of an eligibility profile is available at the end of the document (Tables 2 and 3), but can be retrieved also as XSD scheme from [Downloads 2012](#). The LCCS definitions of the non-agriculture land cover categories to be reported in the ETS, are added at the end of that document.

Go forward to [Field inspection and optional field activities](#)

Go backwards to [Table of contents](#).

13 Field Inspection and optional field activities 2012

version 5.2

NEW ARTICLE

13.1 Scope and purpose of the field data collection

This section provides guidance on the cases where data collection on the field could be required, notably where conditions do not allow Computer-Assisted Photointerpretation (CAPI) to provide sufficient evidence.

ETS 5.2 defines two types of field activities:

- ◇ **Field inspection** - It is the regulated substitution of the CAPI inspection procedure, either as
 1. a discretionary choice of the Member State applied on the complete sample or as
 2. a mandatory activity when triggered by an insufficient sample of measured parcels
- ◇ **Field observation and boundary inspection** - These are activities that can complement the normal CAPI inspection, and are always subject to a discretionary decision of the Member State in support of the CAPI inspection.

Note: In ETS v5.2, field inspections can no longer be applied discretionarily to complement the sample of CAPI measured parcel, as such discretion could lead to the inclusion of only "easy" parcels in the sample and thus bias the ETS results.

The figure below provides a general overview of the decision and activities related to the inspection of complete QE4 and QE2 samples:

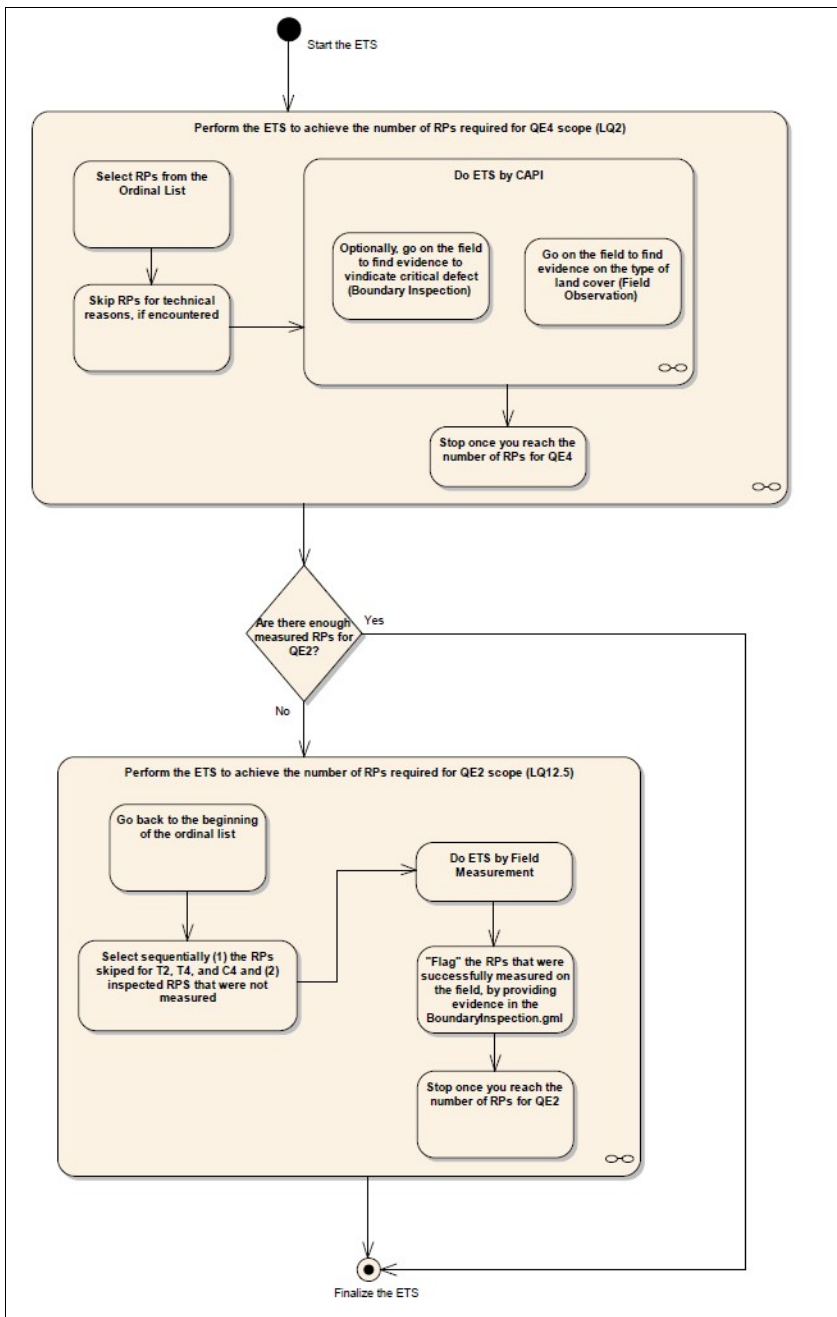


Figure 1: Overview activity diagram for completion of both QE4 and QE2 samples

Please follow this sequence of decisions and actions in order to ensure a successful inspection of complete QE4 and QE2 samples:

- **Step 1:** Perform the ETS inspection to achieve the number of RPs required for QE4 scope (LQ2)
 - ◊ Select RPs from the Ordinal List
 - ◊ Skip RPs for technical reasons, if encountered
 - ◊ Do ETS by CAPI using the LPIS QA image
 - Optionally, go on the field to find evidence to vindicate critical defect (Boundary Inspection)
 - Go on the field to find evidence on the type of land cover (Field Observation)
 - ◊ Stop once you reach the number of RPs for QE4
- **Step 2:** Are there enough measured RPs for QE2?
 - ◊ If affirmative, go directly to Step 4
 - ◊ If negative, continue with Step 3
- **Step 3:** Perform the ETS to achieve the number of RPs required for QE2 scope (LQ12.5)
 - ◊ Go back to the beginning of the ordinal list
 - ◊ Select sequentially the first occurring parcels that during step 1 have been
 1. either **skipped** for T2, T4, and C4
 2. or **inspected but not measured**
 - ◊ Do ETS by Field Measurement
 - ◊ "Flag" those RPs that were successfully measured on the field, by providing evidence in the *BoundaryInspection.gml* (first vertex of the LUI perimeter is identifiable, should be given).
 - ◊ Stop once you reach the number of RPs for QE2
- **Step 4:** Finalize the ETS

13.2 Activities for field data collection

Based on the decision flow scheme, three distinct types of field activities for ETS data collection can be identified.

13.2.1 Field inspection

Field inspection is regulated and replaces the main CAPI component altogether. The complete ETS inspection of the field is performed using GNSS, either for

1. a complete substitution of the CAPI procedure (i.e. applied to all parcels in the sample), when the Member State choose not to use CAPI as an ETS inspection method. As a result, all RP in the sample will be subject to field inspection
2. a partial substitution of the CAPI procedure, when the LPIS design (esp. cadastral parcel systems) does not allow CAPI alone to obtain a sufficient sample of measured parcels to make a valid assessment of QE2. In this case, the parcels subject to field inspection should be taken from the top of the sample pre-selection list and must include those that have been skipped for technical reasons and those that were inspected but not measured. As soon as the QE2 scope is complete, no more field inspections should be performed.

Regarding the second option, it is clear that the CAPI reasons for skipping

1. T2: RP outside all current year images
 2. T4: RP covered by clouds
 3. C4: Land use interpretation impossible or RP boundary problem not resolved on the image
- can indeed no longer be invoked to skip parcels from measurement as it could cause potential bias in the results.

In case the LUI limits are detected and confirmed using GNSS surveying, the ETS operator should perform the land cover mapping exclusively by field, following the compatible surveying specification applicable in the EU Member States.

The activity flow schema of Annex II is, mutatis mutandis, therefore fully applicable.

They formal reporting for the reference parcels subject to ETS field inspections is that:

1. the first vertex only of the initial land cover polygon measured by the surveyor must be reported with its complete documentation in the file *BoundaryInspection.gml*. So only one point (the first) per field inspection has to be reported as a documented field observation.
2. All GNSS surveyed polygons are reported in the file *ETSInspectionMeasurement.gml* joined together with the other, CAPI based inspections of the sample.

Any other information relevant to the execution of the field activities should be reported in the -optional- *SupportiveDocuments.pdf* (part of the ETS archiving package).

13.2.2 Boundary inspection

The survey or verification of the LUI boundary to collect evidence against any suspected critical defect by GNSS.

~~to provide an observation for a reference parcel that was considered not measurable with CAPI but where the inspector proceeded with a field measurement/verification of the LUI boundary or an evidence against invalid perimeter defect (i.e. return at least one GNSS point: coordinates +~~

~~pictures + metadata).~~

The MS decision whether to verify ~~inspect~~ in the field or not is completely discretionary.

~~In case the ETS operator proceeds with a field inspection of the parcel, field evidence that the FULL LUI perimeter is identifiable, should be given. In case the LUI limit coordinates are determined using GNSS survey, the entire land cover inventory should be made exclusively by field survey. No mixture of GNSS and CAPI measurements is allowed.~~

In absence of boundary inspection records or other evidence, the screening activities can only be based on information obtained from the LPIS QA ortho image.

Detailed guidance is available in the support section under [Boundary inspection](#).

13.2.3 Field observation

Field observations deal with the visual observation of the field land features in support of identification of the land cover types detected by CAPI. They are designed to quickly perform a visual check and eventually to confirm certain characteristics of the LUI unresolved by CAPI, such as:

- Exact type of the land cover (on condition that the extent of the LUI was determined already by CAPI);
- Exact type of landscape features already detected;
- Parameters regarding the application of pro-rata concepts;
- Any other visual observation, relevant to the ETS (for example, evidence for critical defects)

Field observations are thus triggered in cases when the ETS operator can delineate properly the land cover features using CAPI. **FO does not involve ? a priori- any area measurements or precise point collection of LUI vertices through GNSS.** However, they usually imply collection of geo-located pictures as supportive evidence.

Detailed guidance is available in the support section under [Field observation](#).

Go forward to [Analysis of observed data](#).

Go backwards to [Table of contents](#).

14 Analysis of observed data 2012

version 5.2

14.1 Introduction

This section is aiming to provide some additional clarifications (whenever is needed) on the post-processing steps applied on the raw observation data, collected during the parcel inspection.

The following issues are discussed:

- clarifications on the calculation of the maximum eligible area (MEA) using the eligibility profile (at reference parcel level)
- subsequent analysis and further investigations of the nature of particular findings, using the data collected from the entire set of quality measures
- calculation of the values of the quality elements at LPIS sample level, on the base of the values retrieved at reference parcel level

14.2 Calculation of the maximum eligible area (MEA) using the eligibility profile

The calculation of the maximum eligible area is based on the input ("DQ_value") from the following data quality measures:

- RP_MEA (RP true eligible area) - 10102
- RP_ELF (RP landscape features area) - 10104_2

The key component allowing the raw ETS observations (mapped land cover features) to be expressed in eligibility term is the **eligibility profile**. It is in fact, a conversion table, translating the results of the land cover mapping into ?eligible hectares or features found?. As the eligibility profile is a prerequisite for the correct conduction of the ETS, it shall be prepared in advance.

The eligibility profile is embedded into the ETS inspection, in a way that allows an automatic calculation of the observed eligible area for each mapped land cover feature on the base of the geometric area of the feature and its land cover class definition. The identification and mapping of any landscape features is managed in the eligibility profile as well.

A brief description of this procedure is given below:

1. For each agriculture land cover feature, which might represent eligible land, found on the LUI:
 1. Assign to **Land cover feature X**, the correspondent *<Land Cover Class>* from your eligibility profile (prepared based on the template given in Table 2, Annex III)
 2. Get the *<Eligible Hectare Factor>* for the given *<Land Cover Class>*
 3. Calculate the eligible area by applying the formula - *<Eligible area of land cover feature X> = <Geometric area of the land cover feature>x<Eligible Hectare Factor> /100*
2. Do the same for the eligible landscape features found on the LUI (those inside or on the immediate border to the agriculture parcel)
3. Sum up the eligible area of all agriculture land cover and eligible landscape features and report the value in square meters, as *<Eligible area observed>*

A template for the eligibility profile is given as [Eligibility profile v5.2](#)

More information on that subject can be found on [Annex III](#)

An example of the implementation of that procedure is given in [Practical guidelines and examples](#).

14.3 Consolidation of the data collected for the other quality measures

Although not used in the calculation of the observed eligible area, some of the other data quality measures at reference parcel level provide important information on parcel properties, which can be used if further analysis is needed.

Different statistics at LPIS sample, supporting the core part of the report can be provided from these quality measures , such as:

- diversity of the land cover inside the reference parcels
- percentage of reference parcels containing "eligible" landscape features
- type non-agriculture land cover found in the reference parcels having critical defects
- etc.

Also, the data collected at reference parcel level, is essential during the "screening" that the Commission is performing on the ETS observations (delivered by the Member State), in order to check the validity of the ETS inspection.

14.4 Further processing towards reporting of non-conforming numbers at LPIS sample level

The aggregated data quality results ("DQ_QuantitativeResult") for the LPIS quality units (elements) associated with the quality expectations, can be aggregated and derived from the ETS observation database collected at parcel level, following the instructions given in Annex I. There can be one or more data quality measures at reference parcel level, which are included as input arguments for the calculation of a particular LPIS quality element. It should be stressed that, depending on the quality measure (at LPIS sample level), the relevant calculation (processing) is applied to a specific DQ_Scope.

How these aggregated data quality results are finally evaluated is presented in the [acceptance decision](#) section.

Go forward to [Acceptance decisions](#)

Go backwards to [Table of contents](#)

15 Acceptance decisions 2012

version 5.2

15.1 Sampling schema table

The rules and criteria for acceptance or rejection of the lot are determined by our choice of acceptance sampling schema. This is *ISO2859-2: Sampling procedures for inspection by attributes, Part 2: Sampling plans indexed by limiting quality (LQ) for isolated lot inspection*. The schema (procedure A) determines the sample size n based on the LPIS (lot) size and provides an acceptance number Ac . If the inspected sample counts more than Ac non-conforming items, the LPIS is considered of failing quality.

For details, look to table 1 that provides the sample sizes n and acceptance number Ac for any given LPIS size and various values of LQ. The table indicates that for a LPIS with more than half a million parcels, under $LQ=2$, a sample of 1250 parcels should be inspected and of this 1250, no more than 18 non-conforming parcels can be present. Indexed by $LQ=12.5$, for the same population, a sample of 200 should be inspected, accepting up to 18 non-conforming parcels therein.

Table 1: sample size 'n' and acceptance number 'AC' indexed by lot size and Limiting Quality

LIMITING QUALITY {LQ}

Lot size		1,25	2,00	3,15	5,00	8,00	12,50
501 to 1200	n	170	125	125	80	50	32
	AC	0	0	1	1	1	1
1201 to 3200	n	200	200	125	125	80	50
	AC	0	1	1	3	3	3
3201 to 10000	n	315	200	200	200	125	80
	AC	1	1	3	5	5	5
10001 to 35000	n	315	315	315	315	200	125
	AC	1	3	5	10	10	10
35001 to 150000	n	500	500	500	500	315	200
	AC	3	5	10	18	18	18
150001 to 500000	n	800	800	800	500	315	200
	AC	5	10	18	18	18	18
> 500000	n	1250	1250	800	500	315	200
	AC	10	18	18	18	18	18

15.1.1 Practical considerations

This choice for ISO2859-2 Procedure A, was driven by the following considerations:

1. Inspection by attributes: a pass/fail verdict is issued for each inspected item (parcel)

- ◇ please note that this is not the case for quality elements 1 and 5 which are in fact a variable
- ◇ also note that requirements are expressed as 'percent non-conforming items'; as a result every inspected item (parcel) either passes or fails if the non-conforming attribute occurs. Each parcel counts only once
 - two non-conformities in a single parcel are counted as one for the given measure
 - parcels entering the DQ_scope of a specific measure on more than one selection criterion (e.g. QE3: it shows a critical defect and has area non conformity) are processed and counted only once.

2. Limiting quality: the product is expected to be 'better' than the specified quality. The quality is expressed in terms of LQ in the various measures of Annex I.

- ◇ please note that the LQ value is not equal to the expectations expressed in the discussion document. In fact, the specified LQ are higher than the expectations; e.g. the expectations 'shall hold no more than 1%' is expressed as a $LQ=2$ and 'shall hold no more than 5%' is expressed as a $LQ=12.5$. In the example above, we can indeed observe that $18/1250$ is larger than the 1% quality expectation..

3. Isolated lot: there is no direct feedback to the production process. Indeed the LPIS under inspections are not sequential lots that form the output of an ongoing production process

- ◇ please note that for remedial processes or contracts, the quality control should preferably address process output where an AQL index is more appropriate than the LQ selected of the LPIS QA.

The ETS deals with expectations for 7 distinct quality elements which bear different levels of expectation. To deal with this potential complication, three choices were made:

1. The more strict the expectation (or the lower the LQ), the larger the sample needed.

- ◇ the most demanding quality element determines the final sample size; for the LPISQA this is QE4

2. For practical reasons, a single inspection procedure is proposed. In this respect, do not stop inspecting attributes for a particular quality element, even when the defined sample size for this quality element has been reached. In stead we proportionally adjust the Acceptance number for that element to match the full sample size.

- ◇ as a result, the less strict quality elements (with higher LQ) are oversampled .

3. Variable measurements (like quality element 1) require much smaller samples than attribute counting for the same effectiveness of the verdict.

◇ as a result, the quality elements that are expressed as variables (QE1 and QE5) are oversampled

Oversampling does require a little bit more inspection work, but adds to the robustness of the verdict.

15.2 Other acceptance decisions

- Quality elements 5 and 7 compare the findings of the LPIS sample with parameters derived from the complete IACS database.

◇ for QE5, no formal quality expectation has been formulated, so no conformance test is performed. All systems are considered conforming if the results data are correctly reported.

◇ for QE7, contribution of poor LPIS elements to irregular applications is assessed through a chi-squared test on the sample.

- Quality element 6 conformance depends on a multi-annual assessment of the results

15.3 LPIS QA instructions

Please remember that the number of inspected parcels has been determined by indexing on LQ 2 as required for QE4 (i.e. parcels checked for defects) and by indexing on LQ12.5 as required for QE2 (i.e. parcels measured) until both indexes reach their required number.

The Member State shall, **for quality elements 2,3,4**

1. use table 2 to determine quality expectations expressed as Limiting Quality for a particular quality element;
2. use table 1 to determine the sample size and acceptance number for a particular quality element;
3. when for any quality element the prescribed sample size is smaller than the actual sample size as inspected during the ETS, increase the found acceptance number proportionally to the ratio of final sample size to pre-scribed sample size. Truncate (DO NOT round) to an integer number;
4. when the observed number on non-conforming parcels exceeds the Acceptance number from 2/ (or 1/) above, assign 'non-conforming' for that element on the scoreboard'

The Member State shall **for quality element 1**

1. use table 2 to determine quality expectations for a particular quality element;
2. assign "non-conforming" to either element when its reported value exceeds the expectation.

The Member State shall **for quality elements 5, 6, 7 report the inspection results and/or conformance verdict from the measures of annex I;**

Table 2: Quality elements and corresponding ETS quality measures (Measure ID and correspondent Table number from Annex I).

Consult the "DQ_ConformanceLevel" attribute within the ETS measure to identify the expectation / limiting quality value. or, where appropriate, the data or conformance verdict

	quality element	ETS measure	table
QE1	The correct quantification of the maximum eligible area	10201	10
QE2	The proportion of reference parcels where the maximum eligible area takes ineligible areas into account or where it does not take agricultural area into account	10202	11
	The distribution of reference parcels where the maximum eligible area takes ineligible areas into account or where it does not take agricultural area into account	10203	12
QE3	The categorisation of reference parcels where the maximum eligible area takes ineligible areas into account or where it does not take agricultural area into account	10204	13
QE4	The occurrence of reference parcels with critical defects	10205	14
QE5	The ratio of declared area in relation to the maximum eligible area inside the reference parcels	10206	15
QE6	The percentage of reference parcels which have been subject to change, accumulated over the years	10207	16
QE7	The rate of irregularities determined during on-the-spot checks	10208	17

15.4 Further reading

Further information on the effectiveness of the verdict and especially the link between LQ and AQL can be found in [this presentation](#).

Go forward to [Annual reporting](#)

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16 Annual ETS reporting 2012

version 5.2

16.1 Purpose of the report

The report allows the MS to convey its findings to the European Commission. It holds a predefined data part and a free-text textual part

16.2 Data part

Notwithstanding the high impact of LPIS in financial terms, the quality inspection itself was based on a relatively small sample of parcels based on a well considered compromise between inspection costs and probability of drawing a false conclusion (ISO 2859-2).

It is therefore imperative that the Commission is able to re-perform the ETS to verify that the sample was drawn in a random manner and that the inspection procedure was correctly implemented. This is not different from the EC audit procedure of the OTSC inspection through the control files of farmer claims.

16.2.1 The ETS reporting package

To enable verification of the inspection method applied, **the ETS reporting package, to be sent to the European Commission, to the unit responsible for IACS, shall hold:**

1. A statement on the ATS conformity, if the LPIS conceptual model has NOT been changed since previous year (pdf)
2. ETS scoreboard: holding the aggregated quality results (ADQR) at LPIS sample level
3. ETS observations: raw observations (observed values) for all measures on all inspected parcels of the sample
4. ETS inspection measurements: geographical features mapped during the ETS inspection for all relevant measures on all inspected parcels of the sample
5. Non-CwRS orthorectified imagery access for the images actually used for the LPIS QA via an INSPIRE compliant WMS. If a Member State doesn't yet have such online service available: alternatively indicate the relevant orthorectified images as delivered to the LPIS QA portal
6. Boundary inspections and Field Observations records containing a description of a field visit and a link to its graphical documentation
7. Sample pre-selection status containing a list of the inspected and skipped (with a valid reason) reference parcels
8. LPIS polygon zero state: extract from the LPIS data under inspection, i.e. reflecting the state at the first step of the ETS: with the reference parcels that were either inspected or skipped (geographical and alphanumeric attributes) as well as boundaries, identifier and reference area of **any** parcel (not restricted to parcels within the scope of the current assessment year) within a distance of 100 meters from the boundary of the inspected or skipped parcel
9. for cadastral parcel or topographic block only: Land administration: all original third party land identification polygons within a distance of 100 meters from the boundary of the inspected parcel (GML: [INSPIRE Annex I, cadastral parcel](#))
10. Member states operating SAPS with historical GAC restrictions ONLY: GAC vector data for the inspected parcels (historical GAC mask).
11. Metadata: an ISO 19157 compliant meta record on the reported quality assesment

16.2.2 The ETS archiving package

The ETS archiving package, to be stored by the Member State, shall hold:

1. inspection records, i.e. the observation logs, source data and ancillary data used for filling in the tables of raw observations
2. an ETS inspection log: i.e. documentation on the environment, tools and activities involved during the inspection

16.2.3 Note

All elements of the ETS reporting package can be easily exchanged with the help of technical templates. These templates are available from the [LPIS QA download pages](#)

16.3 Textual part

Usability drives the assessment of raw scores to lead to meaningful evaluation results in the particular context of the LPIS. For this, the former ETS scoreboard and formerly freetext assesment report have been merged into a single document a [template](#) is provided.

The **assessment report shall contain a summary of the member states' analysis of its scores for each of the 7 quality elements**, in particular relating the scores to the MS context. This assessment report should hold not more than 4 pages and use the template provided on download article. The word version of the scoreboard is hence obsolete, the XML-version of the scoreboard is delivered in the ETS-reporting package above.

Where appropriate, i.e. **when either of quality elements E1, E2, E3, E4, E6 or E7 fails to meet the acceptance threshold, a plan with the remedial actions and the timetable for their implementation shall be added as a separate WORD document**, This summary plan shall build upon the analysis and differentiate between 2013 and after actions. Special consideration shall be given to ongoing refresh projects, if present. The remedial action plan shall hold not more than 2 pages.

The remedial plan should be inspired by the PDCA (Plan, Do, Check, Act) cycle, so possible chapters are:

1. **check**: explain the observed failure to meet the expectation; provide results of additional tests or outcome of a study for a better understanding
2. **act**: correct obvious failures; implement immediate mitigating actions
3. **plan**: explain what the MS intends to do on the long run to address issues not dealt with by the immediate actions
4. **do**: point out elements of that plan, that have been completed in the meantime

16.4 Delivery instructions (Under revision)

For the 2012 implementation, the following delivery instructions apply:

- **The assessment report and, where appropriate, the remedial action plan shall be emailed to agri-direct-support@ec.europa.eu by 31 January 2013 at the latest in MS Word DOC format.**
- **Orthorectified Imagery** should not be uploaded but access should by preference be provided via an INSPIRE compliant web mapping service. If a Member State doesn't yet have such online service available, it may deliver the orthorectified images to the JRC. The following instructions and delivery dates apply:
 1. **EU-financed: 31 December 2012 through delivery to CID by CwRS contractors:** the CwRS contractor should follow CID's instructions of the [imagery delivery CTS2011](#)
 2. **MS-financed: 30 April 2013 through provision of an appropriate URL for the WMS or alternatively delivery via the LPIS QA portal:** For the latter, please follow the procedure described in [non CwRS image delivery](#)
Needless to state that if the imagery used by the CwRS contractors is processed differently than the orthoimagery actually used for LPIS QA, a separate delivery of both sets will be required.
- **The ETS reporting package and ATS reporting package shall be uploaded on the LPIS QA portal by 30 April 2013 at the latest**

Go forward to [Non CwRS-imagery upload](#)

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17 Non-CwRS imagery upload 2012

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NOTE: This instruction only applies to imagery that was **not** acquired by the JRC under its annual CwRS or LPIS QA campaigns. It therefore relates only to the aerial and other imagery that was independently acquired by the Member State for use in support of its inspection of the sample of reference parcels.

For the JRC Imagery, instructions of the Common Technical Specifications for the 2012 CwRS Campaign apply [CTS 2012](#)

17.1 Step 1: Document the metadata

Prepare an entry for control zone and preparation of XML file according to the [OrthoimagerySet.xsd](#), as available on the download article.

This xml-file is a part of the ETS reporting package

- ◇ **ZoneID** of this xml is the MS's identification of the zone, analogue to the CwRS zone naming and mostly linked to acquisition processes.

17.2 Step 2: Check format

Make sure your image is in one of the supported file formats for the image datasets.

- ◇ GeoTIFF
- ◇ ERDAS Imagine (HFA)
- ◇ ECW

Convert or export your imagery to one of these three formats if needed.

If compression method is applied, it should be **lossless only** (for examples LZW for GeoTIFF). Ideally, the orthoimagery should be in the same image format (same encoding and compression parameters) as used in the ETS.

17.3 Step 3: Organise your datasets/files per zone

Group all imagery produced in a single CRS that is relevant for a particular ETS reporting package (i.e. LPIS Authority/reporting year). Please note that

- ◇ a dataset can be provided as a single large image file or as a mosaic of non-overlapping image tiles.
- ◇ all image tiles of the same dataset must have the same coordinate reference system, else the zone needs to be split up in sub-zones.

To compile your complete dataset:

1. Name the dataset: if you have sub-zones, create a unique ID for each individual dataset, otherwise use the LPIS zone ID;
2. Create a folder with the name determined above;
3. Place all files of the dataset (=same CRS,LPIS,year) into that folder;
4. Place the XML file of step 1 in the folder and rename it to **?lpis_ortho_meta.xml?**

17.4 Step 4: Deliver

Deliver the compiled folder(s) either by FTP upload to the JRC server or by shipping DVD's:

- ◇ **FTP-upload:** This requires the use of the following FTP, accessible at the [MARS ftp site](#). Before any action:
 - indicate the approximate amount of data in GigaByte by contacting Slavko Lemajic (slavko.lemajic@jrc.ec.europa.eu),
 - ask for a valid FTP username and password that will be shipped to you by e-mail Slavko Lemajic (slavko.lemajic@jrc.ec.europa.eu),
 - follow the file naming convention (following OrthoimagerySet schema version 5.1: [OrthoimagerySet.xsd](#)):
reportingYear_lpisCode_zoneID_imageAcquisitionDate_platform_pixelSizeM_imageType.appropriateExtension.
 - ◇ For instance: 2011_TEST-LPIS_MZ03_2010-08-17_WORLDVIEW2_0.5_PAN-MUL-FCC-RGB.ecw

- ◇ **Shipping of DVD's or hard disks:** The shipping address is
Slavko Lemajic
TP 266
Via E. Fermi 2749
I-21027 Ispra (VA)
Italy

Please inform this responsible person via mail about the shipment (mailto:slavko.lemajic@jrc.ec.europa.eu).

17.5 Aftermath

- JRC will return haddisks if the MS provides a shipping address.

- The imagery will exclusively be used for screening of the ETS observations by EC staff and will not be available through the CID portal for any other application.

Go forward to [Non-structured evidence upload](#)

Go backwards to [Table of contents](#)

18 Non-structured evidence upload 2012

version 5.2

NEW ARTICLE

NOTE: This instruction applies to data or information that is consulted and considered relevant during the inspection process for which no template is available in the download pages. **Field inspection data (land cover survey or boundary point collection) and field observation records** (formerly named RFV) **collected during the LPIS QA process are not subject to these instructions as the normal schemas of the download page apply.**

Examples of such evidence are:

- ◇ an aid application of a farmer indicating an LPIS update
- ◇ a third party notification of updated status
- ◇ paper documents
- ◇ any log file from the four-eye control
- ◇ any log file from the orthoimagery quality control
- ◇

To provide such unstructured evidence relevant for the inspection and analysis of a particular reference parcel, one needs to use a PDF format. The PDF file should be uploaded through the ETS Reporting Package as an OptionalSupportiveDocument.

To create the PDF, follow these steps:

1. **Indicate** at the top of the each page the Annex I quality measure number where the evidence is used (i.e.: 10106).
2. **Group** the various pieces of evidence per quality measure
3. **Order** the grouped pages of the evidence according to the measure identification on top (i.e.: 10106 before 10107)
4. **Scan, or "print as" PDF** all the individual pieces of evidence. The minimum resolution is 150dpi.
5. **Join/Merge** all individual scans/prints into one PDF document per unique reference parcel where unstructured evidence is to be provided.
6. **Name** the joined PDF according to the reference parcel unique identifier, with a prefix: ?E_?, i.e.: E_AG0192-12.pdf
7. **Zip** these pdf's for all concerned reference parcels in a single archive NonStructuredEvidence.zip
8. **Upload** the NonStructuredEvidence.zip file through the LPIS QA Web Portal via OptionalSupportiveDocument menu item.

Go forward to [Support \(how in practice?\)](#)

Go backwards to [Table of contents](#)

19 Support 2012

version 5.2

Support (how in practice?)

These pages provide supporting information and templates for the implementation of the ATS and ETS inspection procedures. These pages are meant to be informative only.

- ◇ The first section provides an inventory of all download files: discussion documents, references, instructions and templates. Check here that you have all information available
- ◇ The second part covers the tools such as services that are available via the LPIS portal.
- ◇ The third section offers practical examples that clarify typical cases encountered during the inspection procedure.
- ◇ The fourth set of articles provides graphical illustrations of essential concepts of the LPIS QA methodology
- ◇ The fifth entry collects a number of methodological background topics
- ◇ Finally a FAQ-section offers answers to previous questions regarding the LPIS quality assurance framework.

Go forward to [Download pages](#) to see the details.

Go backwards to [Table of contents](#).

20 Downloads 2012

[version 5.2](#)

Technical note: Downloads are realized using FTP protocol, with "Anonymous" login. Please, configure your software correctly if needed.

This section presents a summary of the available supporting documents and templates which are used in the LPIS Quality Assurance Framework. These downloads might be helpful to understand and carry on with the ATS and ETS inspection procedures.

Please look at the validity start date. Updates, bug-fixes and minor modifications will be identifiable on this page by a more recent validity start date "-yyyy-mm-dd".

Warning: Internet Explorer can store the download in the "temporary internet files" folder. Later on, IE will prefer to access the temporarily stored file upon downloading the revised version from our ftp. To ensure a download, remove the stored file from the folder.

20.1 Documents

20.1.1 Background

The discussion document on LPIS quality elements

- October 2011: [printable version](#)
- September 2011: [printable version](#)
- June 2011: [printable version](#)
- June 2011: [version with revision markup](#) (please note deletions or moved paragraphs are not highlighted)
- April 2010: [printable version](#)
- April 2010: [version with revision markup](#)
- November 2009: [formerly known as 11164](#)

20.1.2 Feasibility report

The Report on LPIS Quality Assessment feasibility trial is available at [LPIS QAF feasibility](#).

20.1.3 Technical reports

The report on the first implementation of the LPIS Quality Assessment is available at [2010-2011 LPIS QA results](#).

The report on the second implementation of the LPIS Quality Assessment is available at [2011-2012 LPIS QA results](#).

20.1.4 Peer review report

The peer review report on LPIS Quality Assessment framework by Sytze de Bruin and Gábor Csornai is available at [peer review report](#).

20.1.5 Feature Catalogue documents

UML diagrams and GML encoding for the LPIS Core Model (LCM) are available at: [LCM Technical Specification](#).

The GML application schema for LPIS Core Model can be downloaded from the ftp: [LPIS Core Model Schema](#).

20.1.6 ATS documents

- The LPIS Core Conceptual Model: [LCM Technical Specification](#)

20.1.7 ETS version 5.2 documents

- ANNEX I: LPIS data quality measures [ANNEX I - 2012-06-29](#)
- ANNEX II: ETS inspection procedure ? Description of the workflow [ANNEX II - 2012-06-29](#)
- ANNEX II: UML Activity Diagram visualizing the sequence of the process - [Activity diagram](#) - 2012-06-29
- ANNEX III: The concept of land cover and ?eligible hectares" [ANNEX III - 2012-06-29](#)

Related guidance

- Common Technical Specifications for the 2011 CwRS Campaign [CTS 2011](#)
- Guidelines for Best Practice and Quality Checking of Ortho Imagery, v 3.0 [Orthoguidelines](#)
- Zone definition for the CwRS programme [Zone Definition for the CwRS campaign](#)
- Example of a design of specific land cover class, using LCCS 2.4.5 [Appendix A](#)
- Example of the use of the eligibility profile in the calculation of the maximum eligible area for a given Reference Parcel [Appendix B](#)
- Presentations from the ETS-training, held in Tallinn on 22 November 2011 [ETS Training](#)

20.2 Schemas, templates and examples

In order to assure an appropriate file transfer and information exchange between the Member States (Paying Agencies) and the Commission, a Web-based Portal is under development. The data exchange is performed following the established schemas:

Name	Reporting package	Description	Schemas/Templates for v5.2	Example	Date*
------	-------------------	-------------	----------------------------	---------	-------

Feature Catalogue template	ATS archiving package	A Feature Catalogue template compliant to the proposed by ISO19110 (2003) standard	template_FC.xls		2010-01-01
LPIS Core Model	ATS archiving package	LCM Schema defined as GML Application Schema is used for describing the structure of the LPIS under the Abstract Test Suite.	LCMSchema.xsd		2010-01-01
ATS-log	ATS reporting package	A template for all tests findings: data set name/ attribute name, format, values and definition (ATS-log report)	AtsLog.xsd illustration template (xls)	AtsLog.xml	2011-01-20
ATS scoreboard	ATS reporting package	A template for the final ATS-scoreboard	AtsScoreboard.xsd template (doc)	AtsScoreboard.xml	2011-01-20
LPIS point zero state	Reference Parcel Sampling	A schema for a point representation of reference parcels (point being inside a parcel)	LpisPointZeroState.xsd	LpisPointZeroState.gml	2010-12-20
LPIS sample pre-selection	Reference Parcel Sampling	A schema for a sample pre-selection sent to a MS	LpisSamplePreselection.xsd	LpisSamplePreselection.xml	2010-12-21
LPIS polygon zero state	ETS reporting package	A schema for storing polygons representing reference parcels of a MS	LpisPolygonZeroState.xsd	LpisPolygonZeroState.gml	2011-10-27
ETS inspection measurements	ETS reporting package	A schema for storing ETS inspection measurements as geographical features	EtsInspectionMeasurements.xsd	EtsInspectionMeasurements.gml	2011-10-27
ETS observations	ETS reporting package	A schema for storing ETS observations as simple or complex values	EtsObservations.xsd and the ETS v5.2 schema	EtsObservations.xml and an ETS v5.2 example	2011-10-27 and 2013-04-24
ETS scoreboard	ETS reporting package	A schema for storing ETS Scoreboard	EtsScoreboard.xsd	EtsScoreboard.xml	2011-12-07
LPIS sample pre-selection status	ETS reporting package	A schema for storing the final status of parcels in the sample pre-selection	LpisSamplePreselectionStatus.xsd	LpisSamplePreselectionStatus.xml	2011-10-27
Boundary inspection	ETS reporting package	A file storing data about boundary inspections	BoundaryInspection.xsd	BoundaryInspection.gml	2012-04-18
Field observation	ETS reporting package	A file storing data about field observations	FieldObservation.xsd	FieldObservation.gml	2012-04-18
GAC Mask	ETS reporting package	A schema for storing GAC Mask polygons	GacMask.xsd	GacMask.gml	2011-12-07
Waivers	ATS reporting package	A schema for storing waivers in use	Waivers.xsd	Waivers.xml	2011-10-27
Eligibility Profile	ATS reporting package	A schema for storing an Eligibility Profile	EligibilityProfile.xsd template (xls)	EligibilityProfile.xml	2012-06-28
LPIS Common Types	NA	A common schema referred to by other schemas	LpisCommonTypes.xsd	N/A	2011-10-27
Orthoimagery set	ETS reporting package	A schema for storing metadata about orthoimagery set	OrthoimagerySet.xsd	OrthoimagerySet.xml	2011-10-27
Orthoimagery URL	ETS reporting package	A schema for storing access information to orthoimagery	OrthoimageryUrl.xsd	OrthoimageryUrl.xml	2011-10-27
Applicable CID Zones	Reference Parcel Sampling	A schema for selecting applicable zones stored in the CID portal	ApplicableCidZones.xsd	ApplicableCidZones.xml	2011-06-30
Applicable Proprietary Zones	Reference Parcel Sampling	A schema for additional applicable zones MS will use	ApplicableProprietaryZones.xsd	ApplicableProprietaryZones.gml	2011-07-05

* The date column represents the last modification date of either the schema or its corresponding example. Please, verify the date indicated in the file name after downloading.

20.3 Schema versions log

A list of modification and dates on each of the above schemas can be found in this [standalone log 2011](#) (valid only for v5.1).

The schema set change logs are intended for the IT developers' information only. The article will be updated whenever modifications are implemented to any of the schemas.

Go forward to [Tools \(via Portal\)](#) to see the details.

Go backwards to [Table of contents](#).

21 Tools 2012

version 5.2

21.1 JRC Tools

21.1.1 Web-application for data exchange

A secure web-application is available at: [LPIS QA Web-application](#) to facilitate and assist Member States in the LPIS QA implementation. This platform is used for:

- upload of LPIS GML data (MS-to-JRC),
- download of Sample Pre-selection XML data (JRC-to-MS).

To correctly use it, please refer to the sampling pre-selection procedure at: [Instructions on data exchange](#).

21.1.2 JRC custom built tools

JRC offers these tools as demonstration tools only. They help to understand the GML creation process and helps to create a valid GML file from the original Member State data. The tools are in a draft version, therefore some minor problems can occur (if so, please contact the JRC team with a problem description and a bug report as a print-screen).

When an updated version of a tool is available, the corresponding link will be updated. Please, verify if you are using the latest version.

JRC Tool	Description	Requirements	Link	Date
LPIS Point Zero State	A customized script that creates a valid LPIS Point Zero State GML file from a point-type shapefile.	ArcMap v9.3: Tested on ArcMap version 9.3 service pack 1	LpisPointZeroStateTool - Installation	2011 07 15
LPIS Point Zero State	A customized script that creates a valid LPIS Point Zero State GML file from a point-type shapefile.	ArcMap v10.x: Tested on ArcMap version v10.0 and v10.1	LpisPointZeroStateTool - Follow the instruction of the readme.txt	2013-02-01
LPIS Polygon Zero State	A customized script that creates a valid LPIS Polygon Zero State GML file from a polygon-type shapefile. BETA version, compatible with the gml schema v5.1 (also used on ETS v5.2)	ArcMap v9.3: Tested on ArcMap version 9.3 service pack 1 (also ArcGIS v10; SP2)	Tools_v51 - Installation	2012-03-23
LPIS Polygon Zero State	A customized script that creates a valid LPIS Polygon Zero State GML file from a polygon-type shapefile. BETA version, compatible with the gml schema v5.1 (also used for ETS v5.2)	ArcMap v10.x: Tested on ArcMap version 10.0 and 10.1	LpisPolygonZeroStateTool - Follow the instruction of the readme.txt	2013-01-21
ETS Inspection Measurements	A customized script that creates a valid ETS Inspection Measurement GML file from a set of corresponding layers/shapefiles. BETA version, compatible with the gml schema v5.1	ArcMap v9.3: Tested on ArcMap version 9.3 service pack 1 (also ArcGIS v10; SP2)	Tools_v51 - Installation	2012-03-23
XML (GML) Validator	An application that validates XML and GML files against their schemas.	Microsoft.NET Framework 3.5 or later link	JrcXmlValidator	2010-12-07

Note@2013-01-16: JRC is currently upgrading the ArcGIS v9.3 tools towards ArcGIS v10.x

21.2 Third party commercial tools

These tools are on the commercial market and may help Member States during the implementation of the LPIS QA inspection or further analyses thereafter.

These are commercial products and the entries are provided for information only. JRC does not "certify" or "guarantee" any of these third party tools.

Tool	Description	Requirements	More...
GDV ETS-reporter	Java-based stand-alone software application that covers the process of the LPIS data quality measures (Executable Test Suite).	Standalone, needs Java 1.6 installed	link
Sinergise TopoCheck	tool for spatial and meta-data validation of various datasets. It analyses the data and finds inconsistent records, problematic topologies and it also estimates an area uncertainty of each polygon.	Standalone, needs Java 1.6 installed.	link
Abaco QA ETS Exchange	web application providing the import/export of the Commission selected sample according to ETS guidelines	Any J2EE web container, Oracle Spatial 10g or 11g	link
Abaco QA ETS Inspection	web application managing the Quality Control workload distribution among inspectors. Provides also a tailored ETS GIS editor and the ETS scoreboard in PDF format	Any J2EE web container, Oracle Spatial 10g or 11g.	link
Wageningen UR - Alterra ETS Manager	The ETS Manager is build as an addin for ArcGIS 9.3.1. The current version it tailored to the Dutch and Northern-Irish workflow, but can easily be adjusted according to your specific situation. Multi-user tool for the entire process of LPIS Quality Assessment. Based on file-geodatabase usage. For more detailed information please contact Inez.Woltjer@wur.nl	ArcGIS 9.3.1.	link

21.3 Third party free tools

21.3.1 Ogr2ogr

IMPORTANT: The following conversion does NOT give 100% valid GML file, some small changes are still required to tune the file: "ogr" namespace to "cap" namespace, together with "targetNamespace".

Now we are able to convert the newly created shapefile to a GML file. A tool that could be used for this purpose is ogr2ogr, from [Geospatial Data Abstraction Library](#). Basically, one provides ogr2ogr with the input shapefile, specifies the additional fields (other than spatial ones) that are contained in the GML file, and provides the name of the GML output file:

```
ogr2ogr -f "GML" -a_srs "EPSG:31300" ?nln ?ReferenceParcel? CountryRefParcelPoints.gml CountryShapefilePoints.shp ?sql ?SELECT CAST(ReferenceParcelID AS character)AS rpID, CAST(ReferenceParcelArea AS float) AS referenceArea FROM CountryShapefilePoints?
```

The GML file shall be then zipped and shipped through the LPIS QA web-application to JRC.

21.3.2 FAO LCCS

Software installation setup

The software is freely distributed by FAO and comes with a self-extracting executable file, which produces the entire set of files necessary to run the setup.

The latest stable release of the LCCS (version 2), currently used in the LPIS QA, can be found [here](#)

Classification concepts and user manual

The LCCS software manual provides information on the classification concepts and the practical software use. The first part of the manual fully describes the LCCS used definitions and the conceptual basis. The second part of the manual deals with the LCCS operative use, from installation to extensive explanation of the functioning mode of each one of the program modules.

It is available on the FAO Web site: [LCCS Manual](#).

21.3.3 XML Marker 1.1

XML Marker is a freeware XML Editor that uses a synchronized table-tree-and-text display to show you both the hierarchical and the tabular nature of your XML data.

It automatically produces a tabular display of any selected tag by collecting repeating attribute and tag names and then arranging them into columns. The result is a clutter-free and informative tabular display.

The tool is [here](#) available for downloading.

21.3.4 LPIS-QA-Reporter

In Belgium-Flanders we created a little tool to help creating some xml files for the ETS. Two of the necessary ?ETS Reporting package? xml files are supported at the moment, because they are the most difficult to create manually:

- EtsObservations.xml
- LpisSamplePreselectionStatus.xml

The tool needs a shape file with certain mandatory columns as input (a template shape file and a description of the needed fields is included in the download). Based on this file xml files are generated... Mind: the tool doesn't do an xsd validation, so you still need to use eg. the JrcXmlValidator to validate the xmls!

BTW: This tool is provided free of charge, as is without any guarantees or warranty. The author is not responsible for any damage or losses of any kind caused by the use or misuse of the programs. The author is under no obligation to provide support, service, corrections, or upgrades to the software ;-)...

If you would like to use the tool and want to be notified of new versions or have any remarks, you can contact me here: pieter.roggemans@lv.vlaanderen.be...

You can download the newest version of the tool on this page: [LPIS-QA-Reporter](#)

21.4 Tips and tricks

21.4.1 How to install a JRC ArcGIS script

LPIS Point Zero State and LPIS Polygon Zero State tools consist of several files under a ZIP archive. They run within the ArcMap environment (built for the ArcMap version 9.3). It is a prototype that has not been largely tested yet.

To install the tools in your ArcMap component, you need to:

1. Download the ZIP files from WikiCAP - see above links.
2. Open ArcMap.
3. Go to Tools>Macros>Visual Basic Editor.
4. Delete all the files installed for the previous version of the JRC tools.
5. Import all the files from the new installation (.cls, .bas and .frm) within Normal Project - Normal.mxt - to make it always available to ArcMap.
6. Make sure the the following reference called "Microsoft Scripting Runtime" is checked: Visual Basic>Tools>References>Microsoft Scripting Runtime
7. Save the project.
8. Go to ArcMap, Tools>Customize>[Macros]>...find our Tool (indicated as Normal.ToolName.Run).
9. Drag&drop it on your ArcMap toolbar.
10. Click on the button you have just dropped into the toolbar or alternatively, run the tool from Tools>Macros>Macros>[Macro name]>Run.
11. The tool's window should be opened and ready to be used.

21.4.2 How to run a JRC ArcGIS script (Point/Polygon Zero State)

1. Install a tool correctly.
2. Click on it to open its interface.
3. Select the shapefile/layer you want to convert.
4. Map your corresponding attribute fields.
5. Convert the file by clicking on the Create GML File button.

The **input files** should be:

- ◇ for Point Zero State and Polygon Zero State a simple-point-type or simple-polygon-type shapefile with a defined geographic coordinate system or a projected coordinate system.

The **output file** is a GML-file, compliant with one of the following schemas:

- ◇ [LpisPointZeroState.xsd](#)
- ◇ [LpisPolygonZeroState.xsd](#)

21.4.3 How to run the ETS Inspection Measurements JRC ArcGIS script

1. Install the tool as described in [1].
2. Prepare your ArcGIS project with layers/shapefiles where each layer/shapefile contains only Agriculture Land Cover Features or only Landscape Features of one geometry type (Figure 1).
3. Prepare the required attributes in all your layers/shapefiles as indicated in Table 1.
4. Click on the installed EtsInspectionMeasurement tool to open its interface.
5. Click on the "Build the mapping" button.
6. (Required) Select the layer/shapefile containing Agriculture Land Cover Features (polygons)
7. (Required) Map the attributes from your layer/shapefile to the GML corresponding attributes
8. Select the layer/shapefile containing Landscape Features (polygons). If you do not have landscape features mapped as polygons, leave it empty.
9. Map required attributes
10. Select the layer/shapefile containing Landscape Features (lines). If you do not have landscape features mapped as lines, leave it empty.
11. Map required attributes
12. Select the layer/shapefile containing Landscape Features (points). If you do not have landscape features mapped as points, leave it empty.
13. Map required attributes
14. Select the layer/shapefile containing Landscape Features (multipoints). If you do not have landscape features mapped as multipoints, leave it empty.
15. Map required attributes
16. Convert your data by clicking on the Create GML File button.
17. Validate your GML file with JRC XML Validator

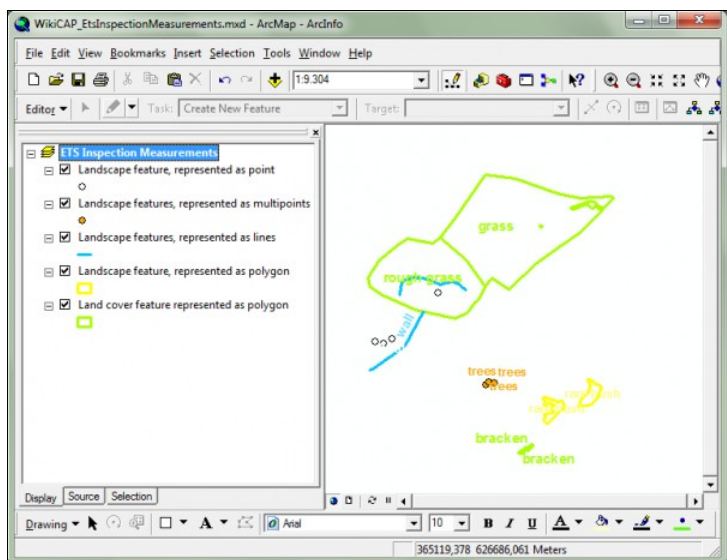


Figure 1. Prepared ArcGIS project for ETS Inspection Measurements conversion. Each layer/shapefile contains only one feature type of one geometry.

Table 1. Mandatory GML attributes

Required GML attribute	Description
rpID	Reference Parcel Unique Identifier
landCoverFeatureID	an internal unique identifier of mapped land cover types (i.e. OBJECTID)
agricultureLandCoverClassCode	Land Cover Class Code from your eligibility profile
codeSpace	urn:ec:lpisqa: REPORTING_YEAR:YOUR_LPIS_CODE:LOT_NUMBER :EligibilityProfile where you need to replace the bold elements with your actual data, i.e. urn:ec:lpisqa:2010:TEST-LPIS:1:EligibilityProfile

The **input files** should be:

- ◇ separate ArcGIS layers or shapefiles containing only Agriculture Land Cover Features or only Landscape Features. Please note that each of the layers/shapefile may only contain features of the same geometry type (polygon/multipolygon, line/polyline, point/multipoint) and should have a defined geographic coordinate system or a projected coordinate system.

The **output file** is a GML-file, compliant with one of the following schema:

- ◇ [EtsInspectionMeasurements.xsd](#)

21.4.4 How to create the point representations of the parcels in ArcGIS

In order to determine the points, a command line function from ArcGIS (under the ArcInfo license) could be used: FeatureToPoint
d:\workspace.mdb\parcels d:\workspace.mdb\parcels_pt INSIDE The syntax for the command is as follows: *FeatureToPoint <in_features> <out_feature_class> {CENTROID | INSIDE}*

Using the function (choosing INSIDE option), a new shapefile will be created. The only difference is that it will contain some point representation of the parcels instead of polygons, for each of the parcels in the original shapefile.

21.4.5 How to open a XML Sample pre-selection in ArcGIS

If you want to relate an XML sample pre-selection file to your ArcGIS project, you need to first open the XML file in the Excell, and then save it in the DBF format. Then, you will be able to relate it to your ArcGIS layers.

21.4.6 How does a correct GML look like?

Download an example: [4_3_LpisPointZeroState_20101220_example.gml](#) The GML file content is illustrated below:

```
<?xml version="1.0" encoding="utf-8" ?>
<cap:FeatureCollection
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://ec.europa.eu/dgagri/cap ftp://mars.jrc.ec.europa.eu/LPIS/Schemas/4_3_LpisPointZeroState_20101220.xsd"
xmlns:cap="http://ec.europa.eu/dgagri/cap" xmlns:gml="http://www.opengis.net/gml"
lpis_code="TEST-LPIS"
lpis_lot="1"
reporting_year="2010">
<gml:boundedBy>
<gml:Box srsName="EPSG:4326">
<gml:coord>
<gml:X>10.131254635</gml:X>
<gml:Y>34.055141255</gml:Y>
</gml:coord>
<gml:coord>
```

```

    <gml:X>14.144205386</gml:X>
    <gml:Y>44.831708765</gml:Y>
  </gml:coord>
</gml:Box>
</gml:boundedBy>
<gml:featureMember>
  <cap:ReferenceParcel fid="F0">
    <cap:geometryProperty>
      <gml:Point srsName="EPSG:4326">
        <gml:coordinates>12.970463244,44.292817075000002</gml:coordinates>
      </gml:Point>
    </cap:geometryProperty>
    <cap:rpID>GH832_A.0305.14/7</cap:rpID>
    <cap:referenceArea>54.231</cap:referenceArea>
  </cap:ReferenceParcel>
</gml:featureMember>
<gml:featureMember>
  <cap:ReferenceParcel fid="F1">
    <cap:geometryProperty>
      <gml:Point srsName="EPSG:4326">
        <gml:coordinates>13.016643059,44.277870450000002</gml:coordinates>
      </gml:Point>
    </cap:geometryProperty>
    <cap:rpID>FD832_A.0305.14/3</cap:rpID>
    <cap:referenceArea>2.9903</cap:referenceArea>
  </cap:ReferenceParcel>
</gml:featureMember>
</cap:FeatureCollection>

```

Figure 2. Example of an LPIS point zero state file.

21.4.7 What are the correct GML attributes?

The INSPIRE Directive, imposes the GML format for the exchange of geospatial data. The following GML Application Schema is defined for LPIS point data [4_3_LpisPointZeroState_20101220.xsd](#). It must be referenced inside the GML:

```

xsi:schemaLocation="http://ec.europa.eu/dgagri/cap ftp://mars.jrc.ec.europa.eu/LPIS/Schemas/4_3_LpisPointZeroState_20101220.xsd"
xmlns:cap="http://ec.europa.eu/dgagri/cap"

```

The GML file created by each LPIS custodian should contain, sequentially the following elements:

```

<gml:featureMember>
  <cap:ReferenceParcel fid="F0">
    <cap:geometryProperty>
      <gml:Point srsName="EPSG:4326">
        <gml:coordinates>12.970463244,44.292817075000002</gml:coordinates>
      </gml:Point>
    </cap:geometryProperty>
    <cap:rpID>GH832_A.0305.14/7</cap:rpID>
    <cap:referenceArea>54.231</cap:referenceArea>
  </cap:ReferenceParcel>
</gml:featureMember>

```

Where:

- **fid**: required by good GML practice. If it is provided, it must be a string that starts with either a letter or the underscore (_) character, followed by printable characters or numbers. fid attribute values must also be unique among all elements in the document.
- **geometryProperty**: a point representation of the reference parcel, giving X and Y coordinates (points shall be INSIDE reference parcels)
- **srsName**: information on the coordinate reference system, given such as an EPSG code, i.e. EPSG 4326
- **rpID**: the unique identification of the reference parcel,
- **referenceArea**: the ?maximum eligible? area of the reference parcel, given in hectares.

Member States shall provide their reference parcels with the above information in the GML format, after they have performed a standard XML validation process (well-formedness and validity).

21.4.8 Clarifications and explanations of the XML elements in the OrthoimagerySet.xml and OrthoimageryUrl.xml

21.4.8.1 OrthoimagerySet.xsd

- **zoneID**

This field provides the Name of the LPIS control zone (either part of the CwRS or proprietary), as

- ◊ defined by the MS administration in the ApplicableCidZones.xml and ApplicableProprietaryZones.gml (relevant for the year of assessment) and
- ◊ listed in the LIO image acquisition system of CID, JRC (for image acquired and provided in the scope of the annual CwRS program)

NOTE 1: The naming convention of the zones imposes a 4 or 5 character abbreviation.

NOTE 2: For orthoimagery provided through WMS by the MS Administration, each LPIS control zone ID should have its correspondent individual entry (layerName) in the OrthoimageryUrl.xml.

- **imageAcquisitionDate**

This entry holds the acquisition date of the source imagery. In case of a LPIS QA control zone covered with multiple acquisitions, the following rules apply:

- ◇ VHR spaceborne data: each acquisition is reported separately; a zone name can occur more than once in the XML, if it is associated with several acquisition dates.
- ◇ airborne data: each acquisition is reported separately if the acquisition covering the zone is not spread over more than 5 calendar days. This means that a zone name (providing it is associated with several acquisition dates) can occur up to 5 times in the XML. When there are more than 5 acquisition dates for the zone, the ?median? date of the temporal acquisition range is reported for a single XML entry. Information on the multiple acquisition dates should be further provided in the ?Unstructured evidence upload?.

NOTE 1: The format of the ?Acquisition date? field is YYYY-MM-DD. **Only orthoimagery acquired in the year of LPIS QA assessment should be given in the OrthoimagerySet.xml.**

• platform

This entry provides the Type (name) of the platform on which the sensor is mounted. For all analogue and digital cameras mounted on an aerial vehicle, the platform is ?AERIAL?. No distinction between the camera type is made. For all sensors mounted on a satellite, the name of the sensor should be provided, as follows:

- ◇ "IKONOS": image acquired by IKONOS
- ◇ "GEOEYE1": image acquired by GeoEye-1
- ◇ "QUICKBIRD": image acquired by Quickbird
- ◇ "WORLDVIEW2": image acquired by Worldview-2

• pixelsizeM

This entry provides the Size of the orthoimage pixel given in meters (rounded to one cm).

NOTE: For all digital sensors, the ratio of the orthoimage pixel size to the ground sampling distance (GSD) should be 1:1, for film cameras it should be at least 1.2:1. For further information see [Orthoguidelines_v3](#)

• imageType

This is a complex XML entry providing information of the type of orthoimage product obtained. It contains (is restricted to) the following values:

- ◇ "PSH": for VHR satellite orthoimage; pan-sharpened; 3 channels only; False Colour Composite
- ◇ "PSH-RGB": for VHR satellite orthoimage; pan-sharpened; 3 channels only; Natural Colour Composite
- ◇ "PSH-FCC-RGB": for VHR satellite orthoimage; pan-sharpened; full spectral range
- ◇ "PAN-MUL-FCC": for VHR satellite orthoimage; bundle (pan+ms); 3 channels only; False Colour Composite
- ◇ "PAN-MUL-RGB": for VHR satellite orthoimage; bundle (pan+ms); 3 channels only; Natural Colour Composite
- ◇ "PAN-MUL-FCC-RGB": for VHR satellite orthoimage; bundle (pan+ms); full spectral range
- ◇ "AERIAL": aerial orthoimagery

21.4.8.2 OrthoimageryUrl.xsd

• imageryUploadedToCid

A "TRUE" entry acknowledges that the orthoimagery has been delivered to CID action of the JRC.

For aerial and other imagery that was independently acquired by the Member State for use in the LPIS QA, the field for imageryUploadedToCid should be set to ?FALSE?, indicating that orthoimagery was provided by either WMS (preferred), or by ftp Upload (see instructions in [Non-CwRS imagery upload 2012](#))

• wmsAccessInformation

This complex XML element provides information on the WMS access details, as follows:

- ◇ url: holds the URI of the WMS. Please leave this field blank, if no WMS is provided.
- ◇ accessCredentials: username and password for accessing the WMS. Please leave these fields blank if there are no credentials required to access the WMS (no username or password required).
- ◇ layerName: Name of the layer in the WMS containing the orthoimage set. Each LPIS QA zone should correspond to a separate layer. This means that there can be more than one layer name entry associated with the ?wmsAccessInformation? field. The layer name should match the entry from the ?zoneID? field of the OrthoimagerySet.xml.
- ◇ ogcFilter: optional field, leave blank if not applicable. For further information please refer to <http://www.opengeospatial.org/standards/filter>

NOTE: By default, all VHR orthoimagery produced from CwRS and LPIS QA images provided by the Commission Services (JRC) should be delivered to CID. We encourage MS to also provide the EC with WMS access for the screening operator, guaranteeing equal environments for inspection and screening.

Go forward to [LPIS QA portal manual](#).

Go backwards to [Table of contents](#).

22 LPIS QA portal manual 2012

The LPIS QA Web Application (<https://lpis.jrc.ec.europa.eu/lq/index.php>) has been developed to support MS with exchange of non-spatial and spatial data with the EC. Its main functionalities are:

- creation and download of sample pre-selection (JRC-to-MS),
- upload of LPIS QA XML and GML data (MS-to-JRC),
- approval if ATS/ETS reporting packages (MS).

22.1 Use case: Registering/recovering of a new user account

1. Fill in the template: [Account_data.doc](#) and send it to Romuald.FRANIELCZYK@jrc.ec.europa.eu
2. You will receive by e-mail your login and password, usually within 48 working hours

22.1.1 Use case: Logging into the LPIS QA Web Application

1. Login to the application using your credentials (username and password)
2. Verify the LPIS Authority set in the left-hand side context menu, under the name of your Member State

22.1.2 Use case: Establishing LPIS Settings

1. Register a lot (lots) of reference parcels for the corresponding reporting year
 - Choose a reporting year
 - Add a new lot
 - Assign a lot ordinal number
 - Provide an exact number of reference parcels for this lot
 - Provide a short name
 - Save all the settings
 - Add new lot if there are several lot defined for the LPIS and repeat the procedure
 - Approve a complete list of lots that are defined for the LPIS. This process will automatically disable a possibility of further changes and send information to the JRC.
2. Register an LPIS Implementation Version (already registered versions will be indicated in a table)
 - Provide a unique name
 - Provide a starting validity date (dd.mm.YYYY)
 - Save all the settings
3. Link registered implementation versions with the pre-defined lots and save your choices
 - Link an appropriate lot to the implementation version from a drop-down menu
 - Save all the settings

22.1.3 Use case: Uploading ATS Reporting Package

1. Select your implementation version for which you want to upload an ATS package
2. Select items to be uploaded from a drop-down menu and upload a selected file. All mandatory items will be listed with asterisk
3. Wait for the confirmation message for each item. You can navigate to the same page in order to edit or deactivate the file
4. Approve the ATS reporting package by clicking 'approve button?'. If there are missing elements they will be indicated in the appropriate table.

22.1.4 Use case: Creating a sample pre-selection

1. Select a reporting year from a drop-down menu
2. Select an LPIS lot from a drop-down menu
3. Select items to be uploaded from a drop-down menu. All mandatory items will be listed with asterisk.
4. Upload a selected file (GML***). All the files will be validated against the appropriate schemas and an e-mail notification will be sent with the validation results.
5. Approve the reporting package by clicking 'approve button?'. If there are missing elements, they will be indicated in the appropriate table. Please note that the package could be reopened, if one of the file turns to be invalid. If so, correct the file and reupload it.
6. The web application will automatically generate a sample pre-selection for you and you will be notified by an e-mail usually within 3 working days

22.1.5 Use case: Downloading a sample pre-selection

1. Download the sample pre-selection file after you have received an e-mail notification.
 - Read an e-mail notification
 - Login to the Web Application
 - Select a reporting year from a drop-down menu
 - Select an LPIS lot from a drop-down menu
 - Download the xml file(s) with sample pre-selection available for you

22.1.6 Use case: Uploading an ETS reporting package

1. Select a reporting year from a drop-down menu.
2. Select an LPIS lot from a drop-down menu.
3. Select ETS reporting package items to be uploaded from a drop-down menu.
4. Upload a selected file (GML***). All the files will be validated against the appropriate schemas and an e-mail notification will be sent with the validation results.
5. Approve the reporting package by clicking ?approve button?. If there are missing elements, they will be indicated in the appropriate table. Please note that the package could be reopened, if one of the file turns to be invalid. If so, correct the file and reupload it.

22.1.7 Use case: Verifying a dashboard

1. Verify the status of the uploaded files for your packages: pending and approved files will be indicated in yellow or green respectively.

***For GML files:

If you are using a standard EPSG code, click on the appropriate choice button.

The only valid EPSG definitions should be, those available on: <http://www.epsg-registry.org/>

If you don't use a standard EPSG code, first upload a projection file through a projection menu.

Then connect an uploaded projection file with your GML file by clicking on a drop-down menu.

IMPORTANT NOTE:

1. When a GML file with specific SRS is uploaded (using .PRJ file), the ESRI-style description of the PRJ (assumed correct by default) might be incompatible with the syntax required by the conversion engine (OGR2OGR) of the web application.

2. OGR2OGR works with SRS having well known definition (ie. EPSG:4326) or described in a file with a WKT (Well-Know Text) definition.

Furthermore the SRS in question should be supported by PROJ.4 (<http://trac.osgeo.org/proj/>)

Go forward to [Practical guidelines and examples](#).

Go backwards to [Table of contents](#).

23 Examples 2012

[version 5.2](#)

This Chapter offers a collection of guidelines and examples for a better and further understanding of the LPIS quality assesment methodology

Go forward to [Examples of parcel inspection](#).

Go backwards to [Table of contents](#).


24 Example of parcel inspection 2012

version 5.2


This section presents an example of inspection of a Reference Parcel. It is limited to the actions applied to data collection only - after the initial inspection feasibility check and prior to the move to the next reference parcel.



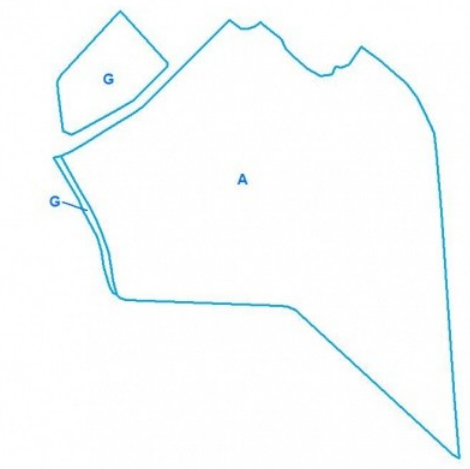
This article has not changed since its ETSv4.3 edition

24.1 Prepare the inspection environment

A reference parcel selected for inspection	
	
<p>Example of a Reference Parcel. LPI parcel boundary is shown in cyan</p>	

24.2 Determination of the agriculture land cover, that might represent eligible land

Action	Example	Result
<p>Identification of individual agriculture land cover features on the land represented by the Reference Parcel. Current year orthophoto (natural color) is used as reference ground data. Additional VHR satellite imagery (acquired in the same year, different month) is used to assess the seasonal aspect of land cover, though the different stages of the vegetation growth. See "the multi-temporal analysis"</p>		<p>Clearly distinct and identifiable agriculture land cover features (A - Arable land; G - Grassland)</p>
	<p>Agriculture land cover features shown with letters</p>	

<p>Delineation (from scratch) of the identified individual agriculture land cover features on the land represented by the Reference Parcel, using information from both image datasets</p>		<p><i>Polygons, enclosing agriculture land cover</i></p>
<p>Determination of the land cover type</p>		<p><i>A - Agricultural land; G - Grassland</i></p>
<p>Calculation of the maximum eligible area for the inspected reference parcel, using the country specific eligibility profile. See "Use of Eligibility Profile"</p>		<p><i>Area of A + Sum Area of G = 112941 + 7257 = 120198 sq. m.</i></p>


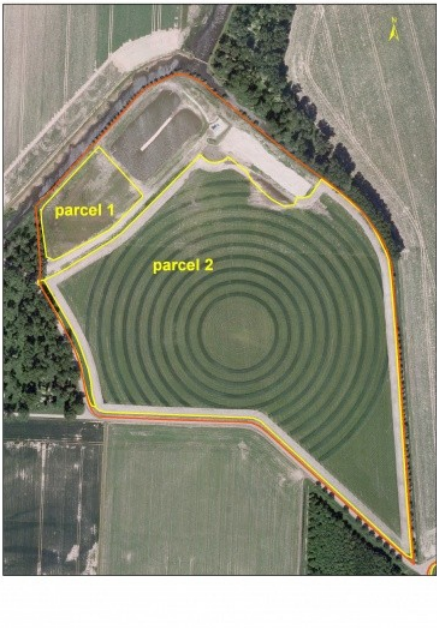
Count the occurrence of the different land cover class types

Arable land ? 1;
Grassland - 1

24.3 Determination the landscape features

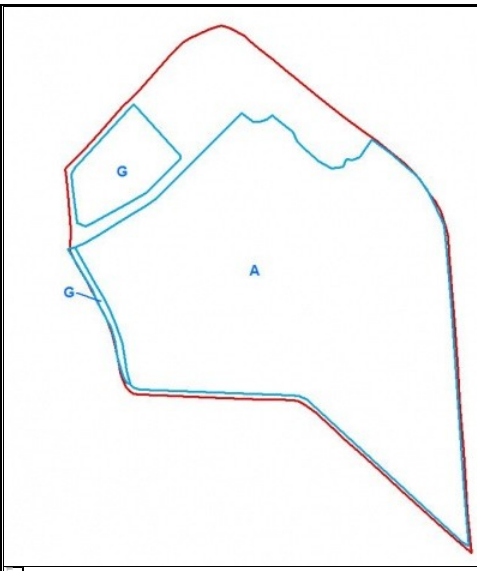

No landscape features in this Reference Parcel

24.4 Identifcation of non-agriculture land cover types and critical anomalies

Action	Example	Result
<p>Determination of the land cover types of the non-agriculture land cover features found on the land represented by the Reference Parcel</p>	 <p>Contours of the digitized agriculture land cover are shown in yellow. LPIS parcel boundary is shown in red.</p>	<p>Several types of non-agriculture land cover types found: woodland, water body, artificially created bare areas, sparsely vegetated areas with isolated shrubs</p>
<p>Counting the abundance of the individual non-agriculture land cover features</p>		<p>Forest and Woodland - 1; Water Bodies - 1; Artificial sealed surface and associated areas - 1; Scrubland -1</p>
<p>Identification and counting of the occurrence of any critical defects, which obstruct the use of the Reference Parcel</p>	 <p>Contours of the digitized agriculture land cover are shown in yellow. LPIS parcel boundary is shown in red</p>	<p>No critical defect found. The inspected Reference Parcel has only two distinctive parts, which could be considered as separate agriculture parcels.</p>

24.5 Check the conformance of the Reference Parcel

Action	Example	Result
--------	---------	--------

<p>Check and report the conformance of the Reference Parcel in respect to the maximum eligible area recorded</p>	 <p>Contours of the digitized agriculture land cover are shown in blue. LPIS parcel boundary is shown in red</p>	<p><i>Area Observed = 94513 sq.m.; Area Recorded = 120198sq.m.; Area Observed/ Area Recorded = 0.79; 21% of ineligible land found; Reference Parcel is non-conformant, as it contains more than 3% ineligible land</i></p>
<p>Identify the causes for the non-conformity of the Reference Parcel</p>	 <p>Area of the parcel, acquired in 2009 (top). Area of the parcel acquired in the previous years (bottom), image from Google Earth</p>	<p><i>Changes of the underlying land were not applied. The reference parcel was not updated</i></p>

Go forward to [Specific examples of ETS observations.](#)

Go backwards to [Table of contents.](#)

25 Specific examples of ETS inspection 2012

version 5.2

This section presents a series of typical examples of ETS observation, grouped thematically. The yellow contour represents the observed agriculture land cover on the orthoimage. The red contours, represent LPIS parcel boundary. For more examples and explanations, see also [S9_Quality_measures_Milenov.pdf](#)

25.1 Examples of agriculture land cover representing eligible land



Permanent crop (example), LCCS code: 10566-1891-S0610 "Permanent crops (vineyards)"

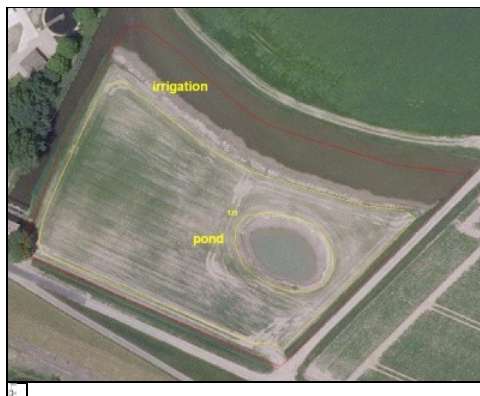


Family gardens (land cover labelled with K), LCCS code: 11135 "Kitchen Gardens"

25.2 Examples of landscape features



Single Trees, LCCS code: 20274-T1(1)[Z11] "Single tree"



Ponds, LCCS code: 7001-5-U1(3)[Z2] "Ponds"



Hedges, LCCS code: 10176(3)[Z1] // 1021110285 "Hedgerows"



Trees in line, LCCS code: 20282-T2(3)[Z4] "Row of trees"

25.3 Examples of non-agriculture land cover



Urban Vegetated Areas (Airport Area), LCCS code: 5001 // 5004 // 11176 "Artificial sealed surface and associated areas"



Wetlands, LCCS code: 41632 "Waterlogged Vegetation"

25.4 Example of parcel with an unclear LUI with no presence of ineligible features in the 5 meters buffer of the LUI perimeter.



A cadastral parcel used as LPIS reference parcel, is located inside a large agriculture block. The boundaries of the reference parcel do not follow any distinctive land feature or well identifiable land cover / land use boundary. Instead, the perimeter of this reference parcel just represents legal boundaries of the real property.

In this condition, the reference parcel is not suitable for the correct localization of the land for the ETS inspection, but this particular defect does not cause a issue in respect to its maximum eligible area, because the complete parcel and all immediate surroundings are pure agricultural lands. Thus, the polygon area is accepted as the eligible area observed.

25.5 Examples of mixed land cover, where application of an appropriate reduction coefficient could be considered to determine the maximum eligible area in accordance with the definitions in R.1122/2009 and R.73/2009

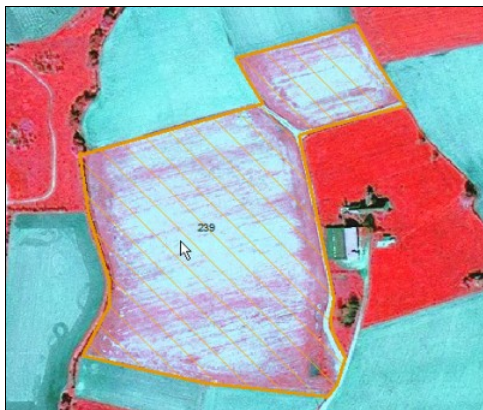


Grassland with sparse shrubs, LCCS code: 20443-13151-T2
"Permanent pasture (self-seed with shrubs)"



Grassland with bare areas and waterlogged vegetation, LCCS code: 40409-4732 "Temporary flooded open grassland"

25.6 Examples of "contaminated" reference parcels



Measurable reference parcel (AP type) with contamination - small road is crossing the reference parcel at its narrowest part



Reference parcel with contamination (forest) - even being at the boundary of the LUI, the forest patch represents a feature that is individually distinguishable inside the LUI, regardless the observation method. The forest patch inside the LUI is outlined in red.

Go forward to [Critical Defects](#).

Go backwards to [Table of contents](#).

26 Critical defects 2012

version 5.2

26.1 Introduction

As it was stated in the [discussion document](#), critical defects are non-compliances having properties that obstruct the use of the parcel regarding:

- either the functions of unambiguous localisation of agricultural parcels, or
- the unique identification for crosschecks of claims.

The nature of a critical defect can differ - non-persistent identifiers, incorrect topology, improper parcel design, etc. Some can be easily detected by spatial or alphanumeric analysis of the geodata stored in the LPIS (for example, errors in topology). Others can be revealed only after an inspection of the Reference Parcel against up-to-date (current year) ground data.

26.2 Detection of the critical defects (examples)

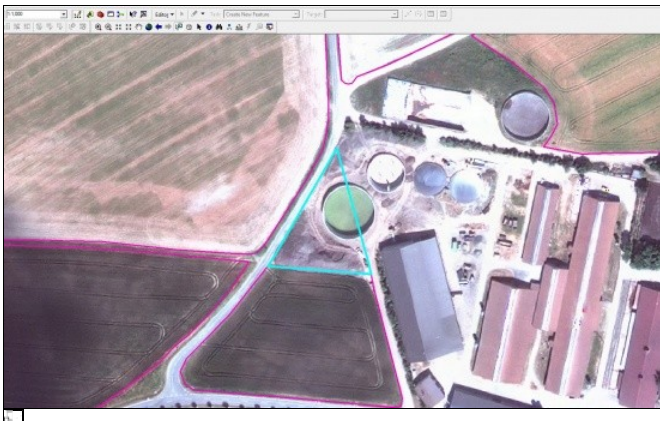
The ETS v5.2 detection of the critical defects (quality measure RP_CRA), is driven by a positive observation of local ground conditions (expressed through the observed land cover and land use), i.e. hard evidence of the occurrence of the above-mentioned non-compliances. This detection considers the context of the particular LPIS design (for example the type of reference parcel applied). If the information from the ground, obtained through the reference orthoimage, is not sufficient for a conclusive decision (i.e. not all conditions were verified), no defect is reported.

This article present real world examples of reference parcels that are subject to such defects:

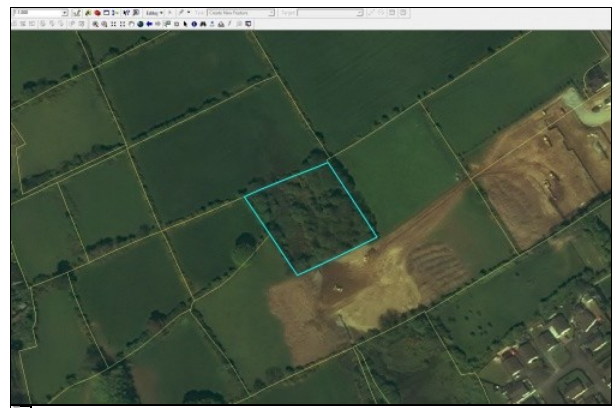
1. a defective parcel on the left i.e. all conditions are positively "CONFIRMED"
2. a normal parcel. i.e. some but not all conditions have been evidenced - "UNCONFIRMED"

26.2.1 Total absence of eligible features (or land)

- Applicable only for reference parcels, holding "non zero" maximum eligible area ReferenceArea.
- Total lack of agriculture land cover, which might represent eligible land on the area represented by the Reference Parcel.



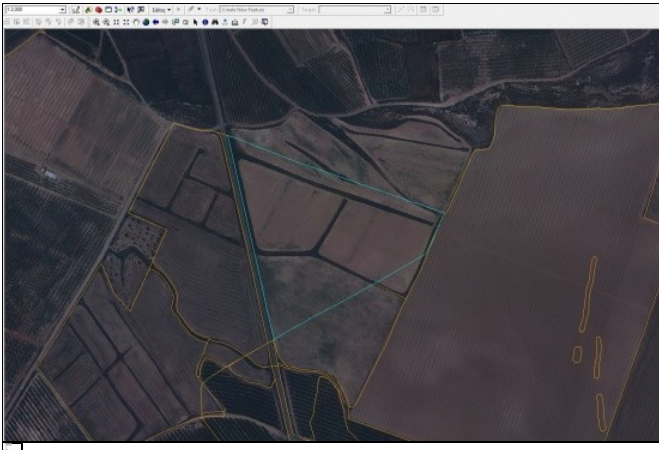
CONFIRMED: The LUI of the inspected RP refers to an area with no agriculture land available (the area represented by the LUI, is part of an industrial site). No eligible land is present. Also, the reference Area of the RP holds a non-zero value.



UNCONFIRMED: The LUI of the inspected RP refers to an area covered with open forest. Although it seems from the orthoimage that no eligible land is present, a Rapid Field Visit (RFV) confirmed eligibility of the land. ACTION: the agriculture land cover on the RP's LUI is mapped (eventually using pro-rata approach) and the RP_MEA is quantified. No critical defect is assigned.

26.2.2 Invalid RP perimeter

- Applicable only for reference parcels that cannot be measured
- and have non-agricultural elements within 5m of the LUI boundary
- and where none of the RP perimeter prime vertices, which outline the LUI, corresponds to an observable ground truth (as visible through the existing land cover, land use features)
- at least one non-agriculture land cover feature is ?crossing? the 5m buffer into the LUI core.



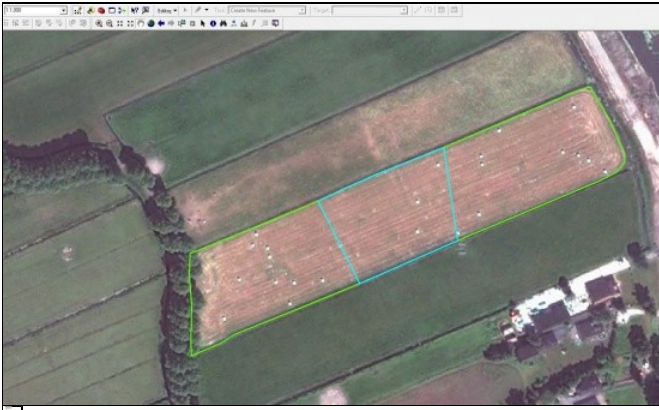
CONFIRMED: The LUI (it's South-Eastern part) doesn't match distinctive land features or follow well identifiable limits of land cover and/or land use, thus it cannot be measured. Also there are non-agriculture features located less than 5 meters from the LUI perimeter. Although parts of the contour (line segments) follow certain limits in land cover (roads), none of the RP perimeter vertices corresponds to the observed ground truth (as visible through the existing land cover, land use features). Also a wide line of trees is crossing into the the South-Eastern part of the LUI core.



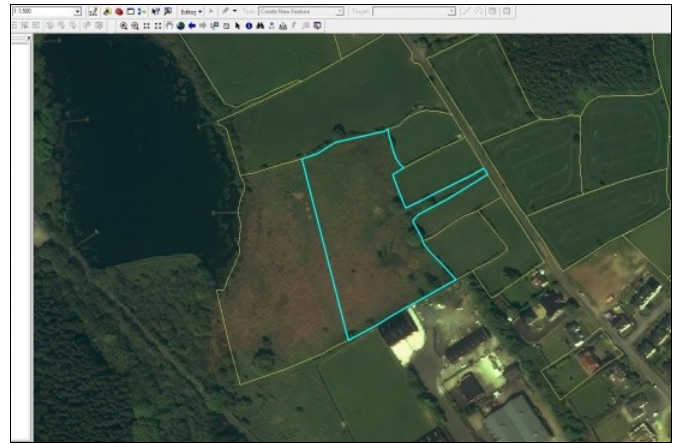
UNCONFIRMED: The LUI (it's South-Western part) doesn't match distinctive land features or follow well identifiable limits of land cover and/or land use. However, the rest of the perimeter match terrain features. ACTION: As there is a non-agriculture land cover feature in the 5-meter buffer on the Northern and Eastern sides of the displayed boundary of the Reference Parcel, the parcel is not measured (the observed eligible area, area declared and the reference area are set to value zero). No critical defect is assigned.

26.2.3 Invalid common RP boundaries

- Applicable only for physical and topographic block systems (PB, TB),
- where the Land use / land cover counter-indicates the presence of common stable physical boundary between the inspected reference parcel and at least two of its neighbouring reference parcels.
- and the common boundary location cannot be derived from surrounding land cover / land use elements.



CONFIRMED: The RP (highlighted in blue) is situated in the middle of the larger production block, which is cultivated as single unit (lines of ploughing are clearly visible). Thus, the observed land use counter-indicates the presence of common stable physical boundary between the inspected reference parcel and two of its neighbouring ones (shown in green). The surrounding land cover / land use feature cannot provide sufficient evidence on the presence or position of the common boundaries on the field.

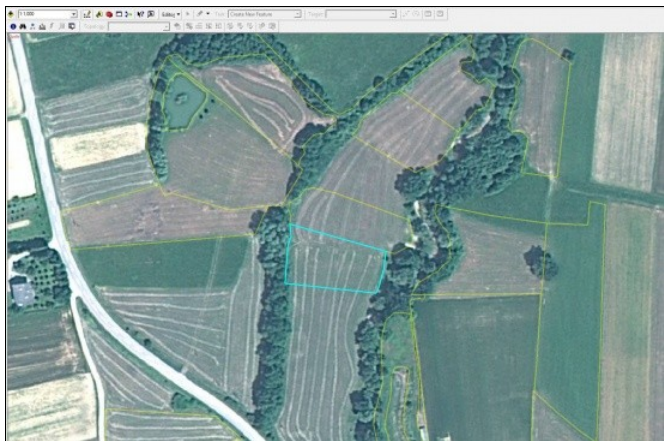


UNCONFIRMED: The common boundary between the RP under inspection (highlighted in blue) and its neighbouring RP on the west, is not present as both clearly constitute a single grassland. But the common boundaries of the inspected RP and all its other neighbours are present. ACTION: As there is a non-agriculture land cover feature in the 5-meter buffer on the Southern side of the displayed boundary of the Reference Parcel, the parcel is not measured (the observed eligible area, area declared and the reference area are set to value zero). No critical defect is assigned.

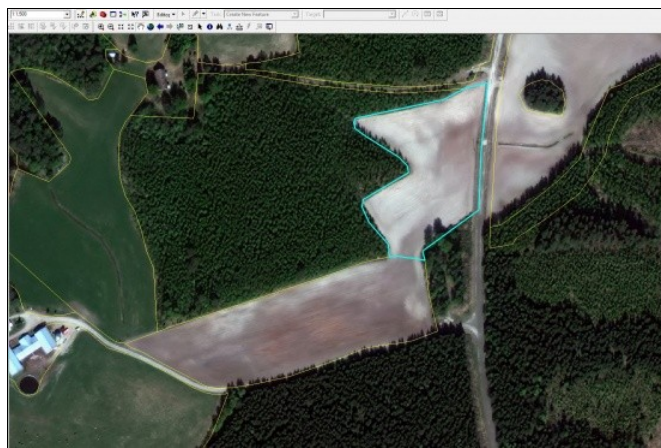
26.2.4 Incomplete block

- Applicable only for (production) block systems (AP/FB/TB/PB)
- where the Land use / land cover counter-indicates the presence of a true stable physical boundary of the block
- and the LPIS does not hold a neighbouring non-zero MEA parcel where the farmer can declare that land clearly in his use. The presence of a reference parcel is **not** restricted to parcels within the scope of the current assessment year.
- and this unaccounted land use indicates that more than 10 percent or 2000m² (whichever is LARGER) of the block area value is missing from the LPIS.
- and the LPIS QA inspection cannot produce external evidence that the land tenure of this unaccounted part of the block is held by a farmer who is not receiving any aid for the assessment year.

The external evidence (5th bullet) vindicating parcels that seem to be incomplete on account of the other visual criteria, needs to be reported for each parcel concerned by the LPIS QA inspector in a separate package.



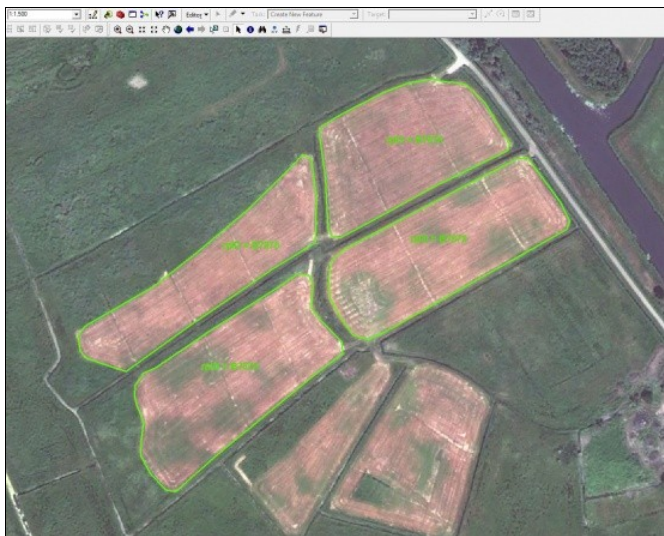
CONFIRMED: The RP (highlighted in blue) is situated in the middle of the larger production block, which is cultivated at once (line of ploughing are clearly visible). Thus, the observed land use counter-indicates the presence of true stable physical boundary. In addition, the LPIS (yellow parcels) does not contain a neighbouring parcel where the farmer could have declared that land upon, and the unaccounted land use indicates that more than 10 percent of the reference area value is missing from the LPIS.



UNCONFIRMED: The RP (highlighted in blue) is situated in the middle of the larger production block, which is cultivated at as a single unit (ploughing lines are clearly visible). Thus, the observed land use counter-indicates the presence of a true stable physical boundary. However, the LPIS (yellow parcels) does contain a neighbouring block where the farmer can declare land upon. ACTION: As there is a non-agriculture land cover feature in the 5-meter buffer on the outer side of the displayed boundary of the Reference Parcel, the parcel is not measured (the observed eligible area, area declared and the reference area are set to value zero). No critical defect is assigned.

26.2.5 Multi-polygon

- Applicable only for (production) block systems (AP/FB/TB//PB)
- where one block (i.e. one RP identifier for is actually composed of two or more disjoint polygons. NOTE: Internal or adjacent polygons representing sub-divisions in a single production block are not multi-polygon defects, but could indicate an ATS or scoping problem (see [our FAQ](#)).



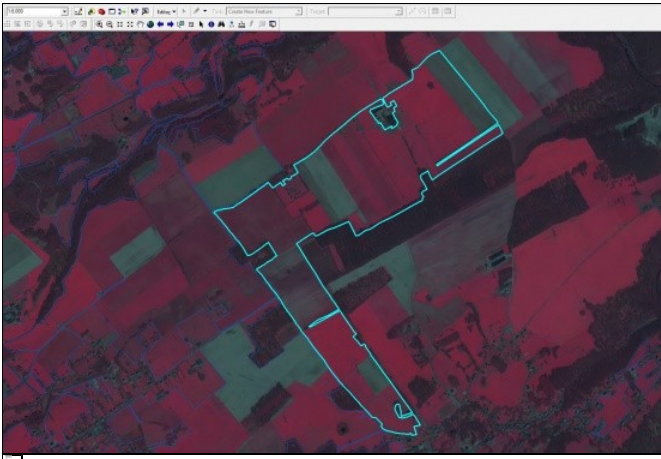
CONFIRMED: The four disjoint polygons (highlighted in green) are identified (associated to) a single single Reference Parcel ID. The LPIS holds no information on the dividing "cross".

26.2.6 Multi-parcel

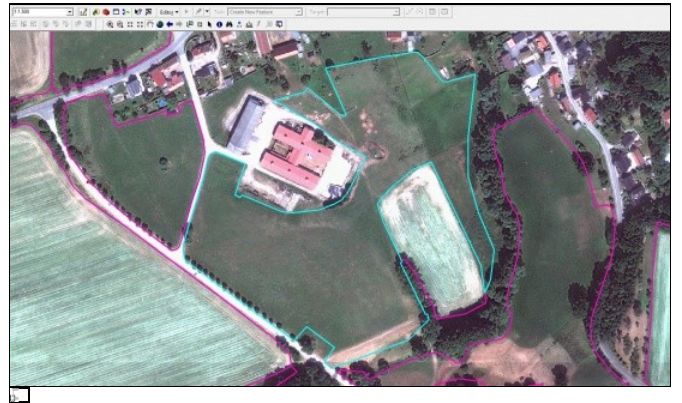
- Applicable only for (production) block systems (AP/FB/TB//PB)
- that are an amalgamate of 10 (ten) or more clearly distinct parcels (i.e. units of agriculture land which according to the internal rules should have been processed separately).



UNCONFIRMED: The two adjacent polygons (highlighted in green, associated to one and the same RP ID, are in fact representing sub-divisions in a single production block and therefore are not multi-polygon defects. Note that there is still a scoping problem as the polygons should have been merged into a single LUI for their common RPID. ACTION: the agriculture land cover on the RP's LUI is mapped and the RP_MEA is quantified. No critical defect is assigned.



CONFIRMED: The inspected RP (highlighted in blue) is a physical block that was composed by more than 10 more clearly distinct parcels (based on the cropping pattern in the adjacent parcels).



UNCONFIRMED: The inspected RP (highlighted in blue) is a farmer block that was composed by few (less than 10) clearly distinct parcels (delimited by fences). ACTION: the agriculture land cover on the RP's LUI is mapped and the RP_MEA is quantified. No critical defect is assigned.

Go forward to [Errors identified during the LPIS QA 2010 screening](#)

Go backwards to [Table of contents](#).

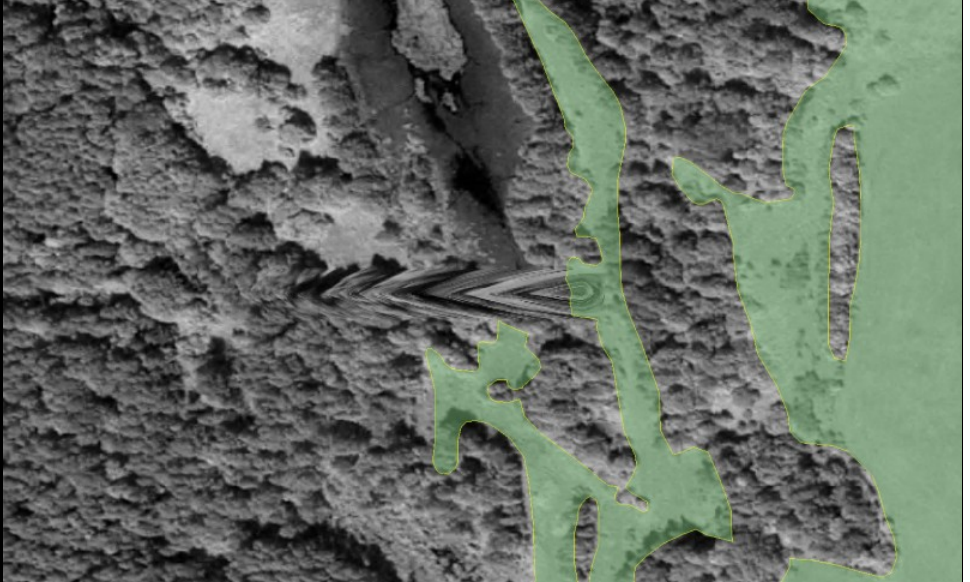
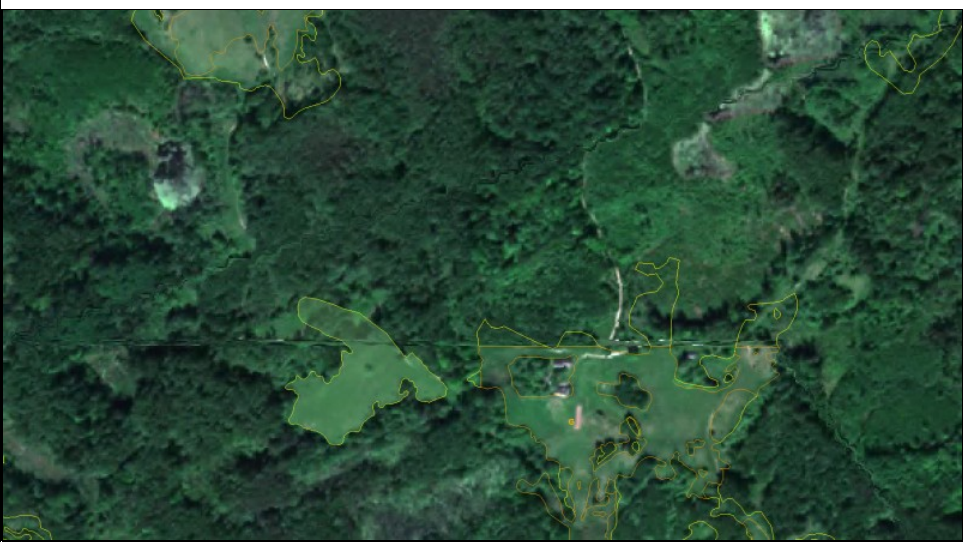
27 Errors identified during the 2010-screening 2012

versions 4.3, 5.1 and 5.2

This page presents typical examples of each type of methodological / technical shortcomings identified during the screening of the 2010 ETS packages. The codes relate to the methodological steps of the 2010 ETS v4.3 in [Annex II](#). Please note that some of these steps have been complete revised for ETS v5.0 and 5.2 in which case this will be indicated for the code concerned.

Each Member state that has successfully uploaded an ETS-package has received an individual screening report as described in [this article](#). Contact your LPIS QA portal contact for a copy.

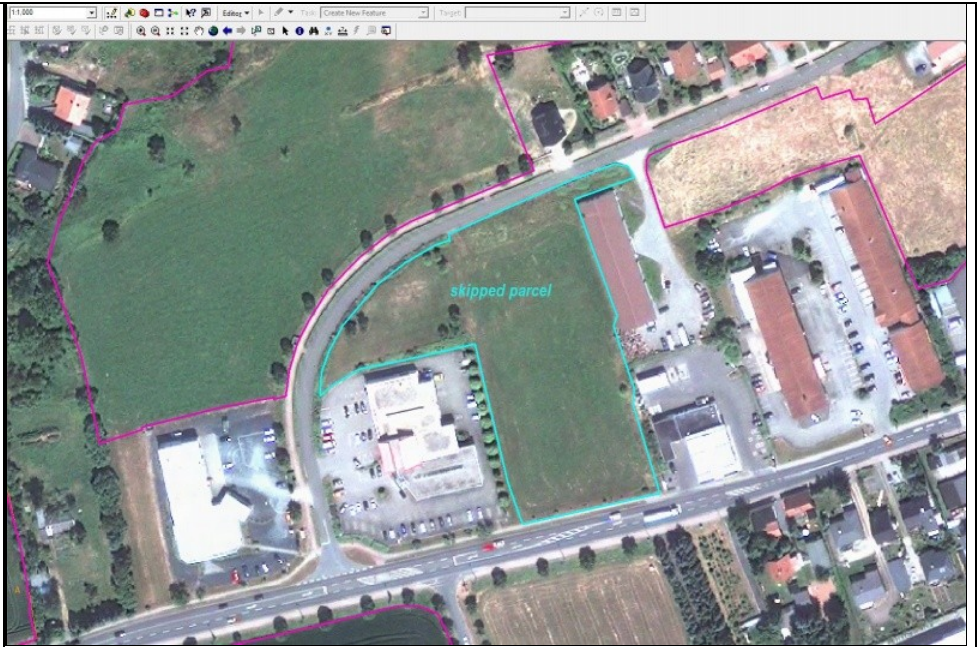
A template of the screening report is available [here](#)

Issues in data preparation (I)	Example
I1 (I4)/Raster data (orthoimagery)/_a. missing orthoimagery (whole or partially)	-
	
I1 (I4)/Raster data (orthoimagery)/_b. errors in orthoimagery processing (f.ex. DEM errors)	
I1 (I4)/Raster data (orthoimagery)/_c. number of orthoimages with poor information content	-
I1 (I4)/Raster data (orthoimagery)/_x. other error	-

I2/LPIS sample pre-selection/possible problem with the scope

The reference parcel (blue line) has been skipped from the inspection. Although no technical reason for such decision can be observed or found (imagery provides full and correct information), the parcel inspection is expected.

Note: The parcel might have been skipped because it is not in the scope any more (not belonging to 1st pillar/not declared). However, it is still an issue, as skipping during the inspection without technical grounds is not supported. Parcels that are not in scope should not have been in the lot from the beginning.



I3/Ancillary data

I4/Completeness and geometric consistency/_a. topological errors in the data base

Neighboring polygons representing eligible area (with FR as land cover type) overlap. As a result the overlapping parts of eligible area will be erroneously calculated double in the results.



I4/Completeness and geometric consistency/_b. lack of 100m buffer in Zero State Polygon GML (yes/no)

The yellow line indicates inspected parcels. A lack of the neighboring parcels (as selected within the 100m buffer) prevents proper validation of the inspected parcel. As a result, tracking specific issues during the screening process may be incomplete.

I14/Parcel inspection feasibility/_b. number of skipped parcels (total)

I15/Parcels with inspection failure/_a. number of incorrectly inspected parcels that should have been skipped

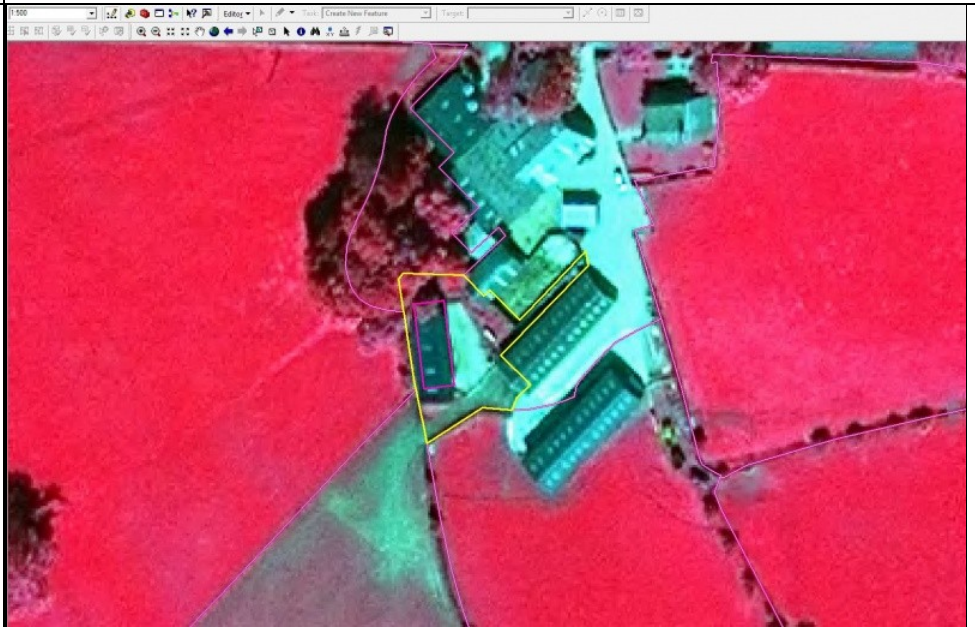
The parcel indicated with an arrow has been inspected although its northern part of the delivered orthoimage is hidden under cloud cover. This parcel is expected to be skipped with the reason of skipping T4 (?Parcel partially or wholly covered by clouds?).

Note: Alternative explanation: the MS may have used an alternative ?suitable- image but failed to provide access to the screening operator.



I15/Parcels with inspection failure/_b. number of incorrectly skipped parcels

The parcel marked with yellow boundary has been skipped from the inspection. No technical failure on the imagery can be detected. The parcel is expected to be inspected and flagged as one with total absence of eligible features.

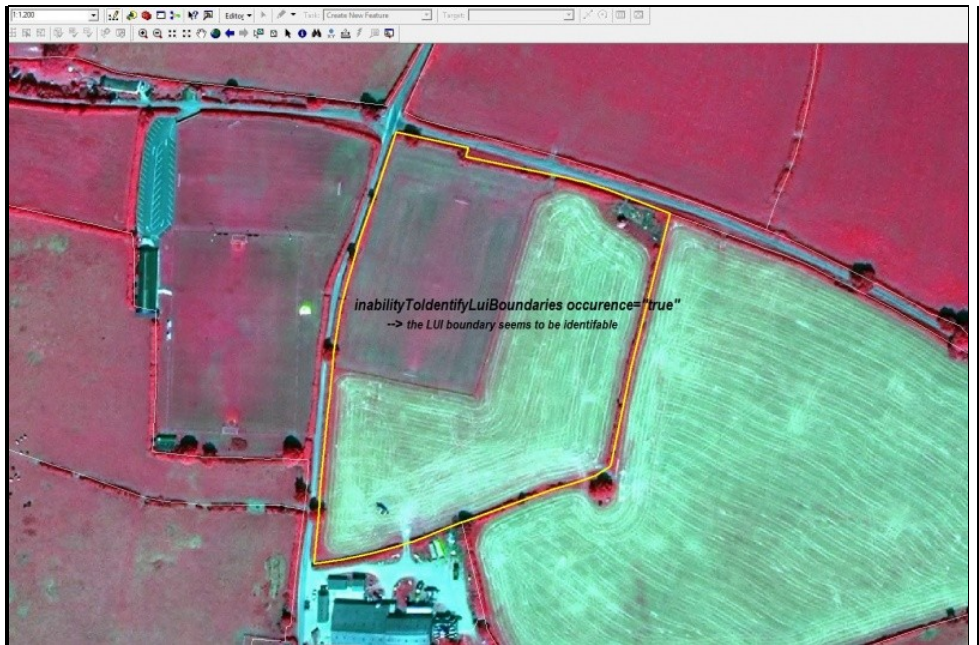


Issues in Reference Parcel inspection (A)

A1/Reference parcel boundaries following land features analyses/incorrect clear or unclear LUI boundary decision

The parcel marked with yellow boundary has been flagged as one with ?inability to identify LUI boundaries occurrence?. The screening process of the parcel evidences the opposite ? the LUI is identifiable and the RP can be measured.

Example



A2/Value of eligible area observed in case of parcel with unclear boundary/incorrect area value assigned

The parcel (blue line) has been correctly flagged as one with ?inability to identify LUI boundaries occurrence = true?. As a consequence, no polygon with eligible area is expected (neither agriculture land cover class nor landscape element). As the parcel is not bordering on non-eligible features, only a numeric number of reference area is expected to appear in RP_MEA field.

Note: ETSv5.1 does require a copy/pasted polygon in this particular case, as a substitute of the LUI external boundary (see also FAQ). It will not be picked up as an issue in LPIS QA 2011.

```

<cap:RP_MEA>48</cap:RP_MEA>
<cap:RP_ELC>
  <cap:agricultureLandCoverClass name="A" codeSpace="urn:ec:lpisqa">
  <cap:agricultureLandCoverClass name="H" codeSpace="urn:ec:lpisqa">
  <cap:agricultureLandCoverClass name="N" codeSpace="urn:ec:lpisqa">
  <cap:agricultureLandCoverClass name="S" codeSpace="urn:ec:lpisqa">
  <cap:agricultureLandCoverClass name="T" codeSpace="urn:ec:lpisqa">
</cap:RP_ELC>
<cap:RP_ALF>
  <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa">
  <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa">
  <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa">
  <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa">
  <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa">
  <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa">
</cap:RP_ALF>
<cap:RP_ELF>65</cap:RP_ELF>
<cap:RP_ANF>
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  <cap:forestAndWoodland abundance="0"/>
  <cap:naturalVegetation abundance="1"/>
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  <cap:naturalBareAreas abundance="0"/>
  <cap:wetland abundance="0"/>
</cap:RP_ANF>
<cap:RP_CRA>
  <cap:inabilityToIdentifyLuiBoundaries occurrence="true"/>
  <cap:discontinuity occurrence="false"/>
  <cap:totalAbsenceOfEligibleFeatures occurrence="false"/>
  <cap:multiParcel occurrence="false"/>
  <cap:multiPolygonReferenceParcel occurrence="false"/>
</cap:RP_CRA>
<cap:RP_CRF>
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  <cap:discontinuity waived="true"/>
  <cap:totalAbsenceOfEligibleFeatures waived="true"/>
  <cap:multiParcel waived="true"/>
  <cap:multiPolygonReferenceParcel waived="true"/>
</cap:RP_CRF>
<cap:RP_CNF>
  <cap:observedToRecordedAreaPercentage>38</cap:observedToRecordedAreaPercentage>
  <cap:observedRecordedAreaDifference>-78</cap:observedRecordedAreaDifference>
</cap:RP_CNF>
  
```



Issues in individual land cover features delineation (B)

B1/Agriculture land cover feature delineation/incomplete land cover identification

The parcel under inspection is marked with green line. The measured and mapped eligible area is marked with yellow line. The screening process of the parcel, suggested an inclusion of the omitted eligible land as belonging to the LUI of the RP (no additional evidence, such as RFV.gml has been provided).

Example





B2/Land cover mapping/_a. imprecise mapping (e.g. not precise enough)

The yellow line represents mapped eligible land polygon. Neither the outer boundaries nor the inner polygon (depicting ineligible house inside) consistently follow the features identified on the imagery. More precise mapping is suggested.



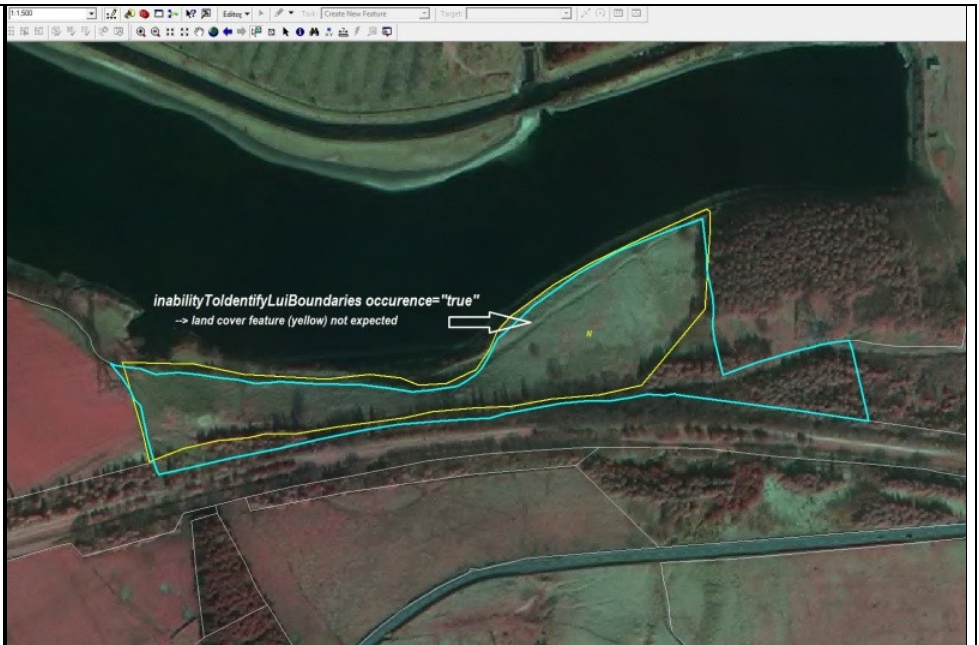
B2/Land cover mapping/_b. inaccurate mapping (e.g. border of a land cover not followed, 'copy-pasting', incorrect snapping)

The parcel under inspection is marked with blue line. Whitish polygons represent the mapped eligible land. The digitized polygons are snapped to the outer boundary of the reference parcel and disregard land cover borders identified on the imagery.



B2/Land cover mapping/_c. presence of unexpected land cover feature

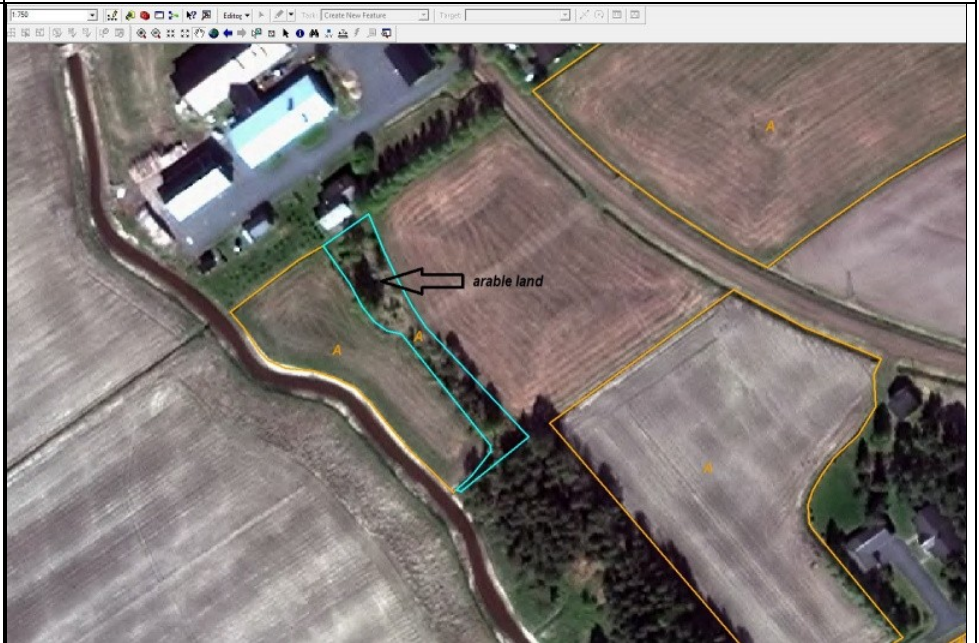
The parcel under inspection (blue line) has been correctly flagged as one with ?inability to identify LUI boundaries occurrence = true?. As the parcel is bordering non-eligible features, no polygon with eligible area is expected (neither agriculture land cover class nor landscape element).



B2/Land cover mapping/_d. incorrect mapping of features below 0,1 ha

B3/Land cover class assignment/incorrect land cover type (attribute) associated with the feature

On the imagery, the mapped land cover polygons incorrectly depict arable land. A different land cover type for the highlighted-blue polygon would be suggested.



B3a/Non-agriculture features smaller then 0,1 ha area estimation/incorrect estimation

B4/Eligible area counting/_a. incorrect eligible area counting

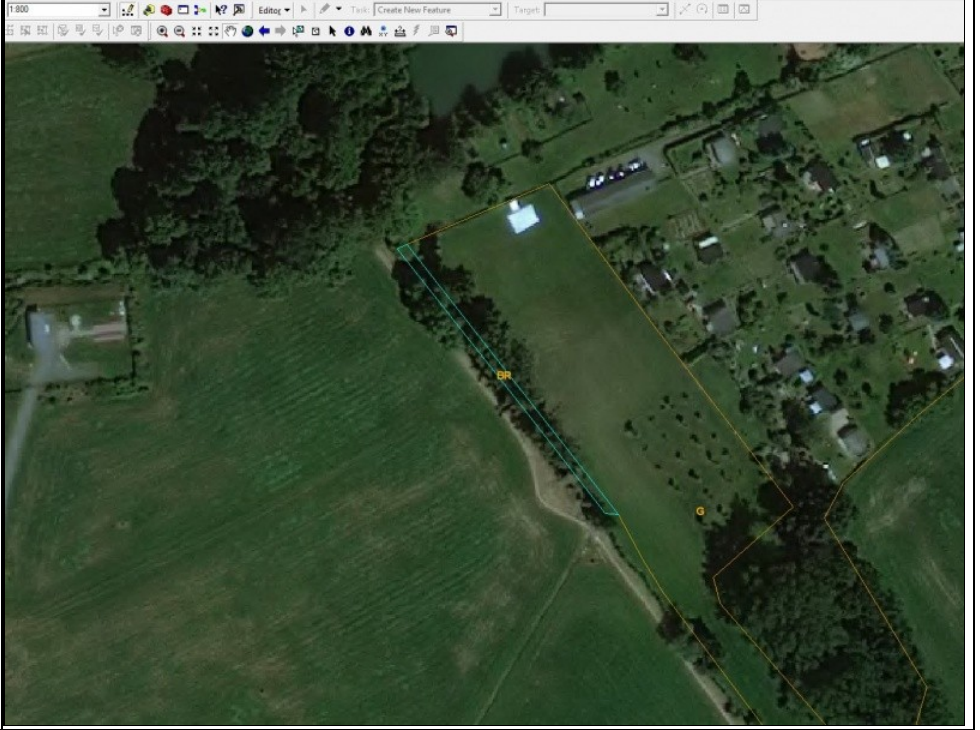
B4/Eligible area counting/_b. incorrect area rounding

For all inspected parcels RP_MEA has been rounded to 100m2. The specified resolution of polygon area is 1m2.

ns1:RP_MEA	name
98200	
20000	N
18100	G
0	
57000	N
21600	A
5600	N
109700	N
8300	N
9900	N
20300	N
700	N
31700	G
0	
29000	G
0	
29900	N
9800	N
2800	N
7500	N
9600	N
7000	G
1100	N

B5/Occurrence of land cover classes appearance/_a. one or more land cover classes

<p>not counted</p> <p>B5/Occurrence of land cover classes appearance/_b. one land cover class mentioned more then once in the data base</p> <p><i>The parcel under inspection has 2 polygons with land cover type ?A? and two polygons land cover type ?B?. In the "RP_ELC" measure, only an occurrence of land cover type should be reported. In this particular example, type ?A? and type ?B? are both expected to be reported only once.</i></p>	<pre> <cap:RP_MEA>226536</cap:RP_MEA> <cap:RP_ELC> <cap:agricultureLandCoverClass name="A" codeSpace="urn:ec:EligibilityProfile" occurrence="true"/> <cap:agricultureLandCoverClass name="B" codeSpace="urn:ec:EligibilityProfile" occurrence="true"/> <cap:agricultureLandCoverClass name="A" codeSpace="urn:ec:EligibilityProfile" occurrence="true"/> <cap:agricultureLandCoverClass name="B" codeSpace="urn:ec:EligibilityProfile" occurrence="true"/> </cap:RP_ELC> <cap:RP_ALF/> <cap:RP_ELF>0</cap:RP_ELF> <cap:RP_ANF> <cap:artificialSealedSurface abundance="0"/> <cap:forestAndWoodland abundance="0"/> <cap:naturalVegetation abundance="0"/> <cap:waterBodies abundance="0"/> <cap:naturalBareAreas abundance="0"/> <cap:wetland abundance="0"/> </cap:RP_ANF> <cap:RP_CRA> <cap:inabilityToIdentifyLuiBoundaries occurrence="false"/> <cap:discontinuity occurrence="false"/> <cap:totalAbsenceOfEligibleFeatures occurrence="false"/> <cap:multiParcel occurrence="false"/> <cap:multiPolygonReferenceParcel occurrence="false"/> </cap:RP_CRA> <cap:RP_CRF/> <cap:RP_CNF/> </pre>
--	---

Issues in eligible landscape features mapping (C)	Example
C1/Landscape feature identification/_a. existing landscape features not identified	
C1/Landscape feature identification/_b. incorrect identification of landscape features	
<p>C2/Landscape features mapping</p> <p><i>The highlighted blue polygon is representing a landscape feature border. After the screening process, more accurate mapping is suggested.</i></p>	
C3/Landscape features land cover assignment	
<p>C4/Landscape features counting/_a. no features counted</p> <p><i>The highlighted blue landscape feature polygon clearly belongs to the inspected parcel (yellow boundary with diagonal hatch). The occurrence of this element is missing in the observations XML.</i></p>	

```

<cap:RP_MEA>7290</cap:RP_MEA>
<cap:RP_ELC>
  <cap:agricultureLandCoverClass name="A" codeSpace="urn:ec:lpisqa" EligibilityProfile" occurrence="t
</cap:RP_ELC>
<cap:RP_ALF>
  <cap:landscapeFeature name="HE" codeSpace="urn:ec:lpisqa EligibilityProfile" abundance="0" />
  <cap:landscapeFeature name="PO" codeSpace="urn:ec:lpisqa EligibilityProfile" abundance="0" />
  <cap:landscapeFeature name="RT" codeSpace="urn:ec:lpisqa EligibilityProfile" abundance="0" />
  <cap:landscapeFeature name="WB" codeSpace="urn:ec:lpisqa EligibilityProfile" abundance="0" />
</cap:RP_ALF>
<cap:RP_ELF>0</cap:RP_ELF>
<cap:RP_ANF>
  <cap:artificialSealedSurface abundance="0" />
  <cap:forestAndWoodland abundance="0" />
  <cap:naturalVegetation abundance="0" />
  <cap:waterBodies abundance="0" />

```

C4/Landscape features counting/_b. incomplete counting

C5/Landscape feature area derivation/_a. landscape feature area not assigned

The polygon landscape element (purple line) has no area assigned (RP_ELF = 0). Moreover the polygon overlaps with the agriculture land polygon.

```

<cap:RP_MEA>2127</cap:RP_MEA>
<cap:RP_ELC>
  <cap:agricultureLandCoverClass name="AR" codeSpace="urn:ec:lp:
  <cap:agricultureLandCoverClass name="TC" codeSpace="urn:ec:lp:
  <cap:agricultureLandCoverClass name="FR" codeSpace="urn:ec:lp:
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  <cap:landscapeFeature name="SW" codeSpace="urn:ec:lpisqa:2010
  <cap:landscapeFeature name="AF" codeSpace="urn:ec:lpisqa:2010
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  <cap:naturalVegetation abundance="1" />
  <cap:waterBodies abundance="0" />
  <cap:naturalBareAreas abundance="0" />
  <cap:wetland abundance="0" />
</cap:RP_ANF>
<cap:RP_CRA>
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  <cap:discontinuity occurrence="false" />
  <cap:totalAbsenceOfEligibleFeatures occurrence="false" />
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  <cap:multiPolygonReferenceParcel occurrence="false" />
</cap:RP_CRA>
<cap:RP_CRF>
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  <cap:discontinuity waived="false" />
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  <cap:multiPolygonReferenceParcel waived="false" />
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  <cap:observedRecordedAreaDifference>321</cap:observedRecorded/
</cap:RP_CNF>
<cap:RP_CNT>
  <cap:artificialSealedSurface contamination="false" rpWaivered:
  <cap:forestAndWoodland contamination="false" rpWaivered="false"
  <cap:naturalVegetation contamination="true" rpWaivered="false"
  <cap:waterBodies contamination="false" rpWaivered="false" />

```

C5/Landscape feature area derivation/_b. landscape features area incorrectly added to RP_MEA

The parcel under inspection (blue line) is delineated as agriculture land ?A? (polygon area = 133) and the landscape feature (polygon area = 17). In total, the measured eligible area of the parcel under inspection is 150. With a recorded Reference Area is 129, the RP_CNF results should be = 116% (=150/129) and 21 (=150-129).

<pre> <cap:RP_MEA>133</cap:RP_MEA> <cap:RP_ELC> <cap:agricultureLandCoverClass name="A" codeSpace="urn:ec:lpisqa: <cap:agricultureLandCoverClass name="M" codeSpace="urn:ec:lpisqa: <cap:agricultureLandCoverClass name="N" codeSpace="urn:ec:lpisqa: <cap:agricultureLandCoverClass name="S" codeSpace="urn:ec:lpisqa: <cap:agricultureLandCoverClass name="T" codeSpace="urn:ec:lpisqa: </cap:RP_ELC> <cap:RP_ALF> <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa:2010 <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa:2010 <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa:2010 <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa:2010 <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa:2010 <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa:2010 <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa:2010 <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa:2010 <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa:2010 <cap:landscapeFeature abundance="0" codeSpace="urn:ec:lpisqa:2010 </cap:RP_ALF> <cap:RP_ELF>17</cap:RP_ELF> <cap:RP_ANF> <cap:artificialSealedSurface abundance="0"/> <cap:forestAndWoodland abundance="0"/> <cap:naturalVegetation abundance="0"/> <cap:waterBodies abundance="0"/> <cap:naturalBareAreas abundance="0"/> <cap:wetland abundance="0"/> </cap:RP_ANF> <cap:RP_CRA> <cap:inabilityToIdentifyLuiBoundaries occurrence="false"/> <cap:discontinuity occurrence="false"/> <cap:totalAbsenceOfEligibleFeatures occurrence="false"/> <cap:multiParcel occurrence="false"/> <cap:multiPolygonReferenceParcel occurrence="false"/> </cap:RP_CRA> <cap:RP_CRF> <cap:inabilityToIdentifyLuiBoundaries waived="true"/> <cap:discontinuity waived="true"/> <cap:totalAbsenceOfEligibleFeatures waived="true"/> <cap:multiParcel waived="true"/> <cap:multiPolygonReferenceParcel waived="true"/> </cap:RP_CRF> <cap:RP_CNF> <cap:observedToRecordedAreaPercentage>103</cap:observedToRecorded <cap:observedRecordedAreaDifference>4</cap:observedRecordedAreaDI </cap:RP_CNF> </pre>	
<p>C5/Landscape feature area derivation/_c. landscape feature area calculated incorrectly</p>	

Issues in non-agriculture land cover features and "potential" critical defects on the land represented by the RP identification (D)

D1/Non-agriculture land cover types determination/_a. no determination

<p>D1/Non-agriculture land cover types determination/_b. incorrect determination</p> <p>The yellow line shows reference parcel boundary. Artificial sealed surfaces (buildings) are not part of the LUI, therefore are not expected to be reported in Observations XML, as they are not part of the LUI.</p>	<pre> 1343 <cap:RP_MEA>2600</cap:RP_MEA> 1344 <cap:RP_ELC> 1345 <cap:agricultureLandCoverClass name="B" codeSpace="urn:ec:lpisqa:2010 1:EligibilityProfile" occurrence="true" /> 1346 </cap:RP_ELC> 1347 <cap:RP_ALF /> 1348 <cap:RP_ANF> 1349 <cap:artificialSealedSurface abundance="1" /> 1350 <cap:naturalVegetation abundance="0" /> 1351 <cap:waterBodies abundance="0" /> 1352 <cap:naturalBareAreas abundance="0" /> 1353 <cap:wetland abundance="0" /> 1354 </cap:RP_ANF> 1355 <cap:RP_CRA> 1356 <cap:inabilityToIdentifyLuiBoundaries occurrence="false" /> 1357 <cap:discontinuity occurrence="false" /> 1358 <cap:totalAbsenceOfEligibleFeatures occurrence="false" /> 1359 <cap:multiParcel occurrence="false" /> 1360 <cap:multiPolygonReferenceParcel occurrence="false" /> 1361 </cap:RP_CRA> 1362 <cap:RP_CRF /> 1363 <cap:RP_CNF> 1364 <cap:observedToRecordedAreaPercentage>96.29429</cap:observedToRecordedAreaPercentage> 1365 <cap:observedRecordedAreaDifference>-100</cap:observedRecordedAreaDifference> 1366 </cap:RP_CNF> 1367 <cap:RP_CMT> 1368 <cap:artificialSealedSurface contamination="true" rpWaived="false" /> 1369 <cap:forestAndWoodland contamination="true" rpWaived="false" /> 1370 <cap:naturalVegetation contamination="true" rpWaived="false" /> 1371 <cap:waterBodies contamination="true" rpWaived="false" /> 1372 <cap:naturalBareAreas contamination="true" rpWaived="false" /> 1373 <cap:wetland contamination="true" rpWaived="false" /> 1374 </cap:RP_CMT> 1375 <cap:RP_CDI> 1376 <cap:inabilityOfTheUnderlyingLandUseToBeApplied occurrence="false" /> 1377 <cap:revisionsOfTheRegulationsWereNotApplied occurrence="false" /> 1378 <cap:incompleteProcessing occurrence="false" /> 1379 <cap:irregularProcessing occurrence="false" /> 1380 <cap:incompatibleLpisDesign occurrence="false" /> 1381 <cap:observedEligibleAreaIsNotTheSameAsObserved occurrence="false" /> 1382 </cap:RP_CDI> 1383 </cap:RP_CNF> 1384 </cap:RP_CNF> </pre>
--	--

D2/Non-agriculture land cover types counting (by type)

<p>D3/Non-agriculture land cover types counting (by type)/_a. incorrect lack of detection of PCD</p> <p>The reference parcel (blue line) is suggested to have a value of ?true? for total absence of eligible features.</p>	<pre> </cap:RP_ALF> <cap:RP_ELF>0</cap:RP_ELF> <cap:RP_ANF> <cap:artificialSealedSurface abundance="0"/> <cap:forestAndWoodland abundance="0"/> <cap:naturalVegetation abundance="1"/> <cap:waterBodies abundance="2"/> <cap:naturalBareAreas abundance="0"/> <cap:wetland abundance="0"/> </cap:RP_ANF> <cap:RP_CRA> <cap:inabilityToIdentifyLuiBoundaries occurrence="false"/> <cap:discontinuity occurrence="false"/> <cap:totalAbsenceOfEligibleFeatures occurrence="false"/> <cap:multiParcel occurrence="false"/> <cap:multiPolygonReferenceParcel occurrence="false"/> </cap:RP_CRA> <cap:RP_CRF> <cap:inabilityToIdentifyLuiBoundaries waived="false" /> <cap:discontinuity waived="false" /> <cap:totalAbsenceOfEligibleFeatures waived="false" /> <cap:multiParcel waived="false" /> <cap:multiPolygonReferenceParcel waived="false" /> </cap:RP_CRF> <cap:RP_CNF> <cap:observedToRecordedAreaPercentage>61.75</cap:observedToRecordedAreaPercentage> <cap:observedRecordedAreaDifference>153</cap:observedRecordedAreaDifference> </cap:RP_CNF> <cap:RP_CMT> <cap:artificialSealedSurface contamination="false" rpWaived=" <cap:forestAndWoodland contamination="false" rpWaived="false" <cap:naturalVegetation contamination="true" rpWaived="true" <cap:waterBodies contamination="true" rpWaived="true" waived <cap:naturalBareAreas contamination="false" rpWaived="false" <cap:wetland contamination="false" rpWaived="false" /> </cap:RP_CMT> </pre>
---	--

D3/Non-agriculture land cover types counting (by type)/_b. incorrect PCD coding

D3/Non-agriculture land cover types counting

(by type)/_c. incorrect type of PCD recorded

Issues in the conformance of the Reference Parcel check (E)	Example																																																																																	
E1/"Waivered" critical defects check/_a. lack of the waiver indication																																																																																		
E1/"Waivered" critical defects check/_b. waiver condition not respected/documented																																																																																		
E1/"Waivered" critical defects check/_c. inappropriate application of waiver																																																																																		
<p>E2/Area-based conformance check/_a. incorrect values rounding</p> <p><i>Observed area recorded is expected to have arithmetic precision of 1m2.</i></p>	<table border="1"> <thead> <tr> <th>ns1:observedToRecordedAreaPercentage</th> <th>ns1:observedRecordedAreaDifference</th> <th>contan</th> </tr> </thead> <tbody> <tr><td>100.00</td><td>0</td><td></td></tr> <tr><td>156.52</td><td>3900</td><td></td></tr> <tr><td>92.38</td><td>-1600</td><td></td></tr> <tr><td>100.00</td><td>0</td><td></td></tr> <tr><td>71.43</td><td>-800</td><td></td></tr> <tr><td>101.42</td><td>300</td><td></td></tr> <tr><td>97.75</td><td>-2400</td><td></td></tr> <tr><td>100.00</td><td>0</td><td></td></tr> <tr><td>102.44</td><td>200</td><td></td></tr> <tr><td>100.00</td><td>0</td><td></td></tr> <tr><td>100.33</td><td>500</td><td></td></tr> <tr><td>100.00</td><td>0</td><td></td></tr> <tr><td>99.65</td><td>-300</td><td></td></tr> <tr><td>100.41</td><td>200</td><td></td></tr> <tr><td>415.38</td><td>24600</td><td></td></tr> <tr><td>100.00</td><td>0</td><td></td></tr> <tr><td>86.03</td><td>-2500</td><td></td></tr> <tr><td>100.00</td><td>0</td><td></td></tr> <tr><td>100.88</td><td>100</td><td></td></tr> <tr><td>102.17</td><td>100</td><td></td></tr> <tr><td>100.00</td><td>0</td><td></td></tr> <tr><td>99.60</td><td>-400</td><td></td></tr> <tr><td>0.00</td><td>-4000</td><td></td></tr> <tr><td>100.00</td><td>0</td><td></td></tr> <tr><td>102.86</td><td>200</td><td></td></tr> <tr><td>100.00</td><td>0</td><td></td></tr> </tbody> </table>	ns1:observedToRecordedAreaPercentage	ns1:observedRecordedAreaDifference	contan	100.00	0		156.52	3900		92.38	-1600		100.00	0		71.43	-800		101.42	300		97.75	-2400		100.00	0		102.44	200		100.00	0		100.33	500		100.00	0		99.65	-300		100.41	200		415.38	24600		100.00	0		86.03	-2500		100.00	0		100.88	100		102.17	100		100.00	0		99.60	-400		0.00	-4000		100.00	0		102.86	200		100.00	0	
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100.00	0																																																																																	
102.44	200																																																																																	
100.00	0																																																																																	
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102.86	200																																																																																	
100.00	0																																																																																	
<p>E2/Area-based conformance check/_b. incorrect values calculation</p> <p><i>For the inspected parcel with reference area = 5300 and measured eligible area = 5446, expected values in RP_CNF would be 103% (=5446/5300) and 146 (=5446-5300).</i></p>	<pre> <cap:RP_MEA>5446</cap:RP_MEA> <cap:RP_ELC> <cap:agricultureLandCoverClass name="A" codeSpace="urn:ec:lpisq: <cap:agricultureLandCoverClass name="G" codeSpace="urn:ec:lpisq: <cap:agricultureLandCoverClass name="N" codeSpace="urn:ec:lpisq: <cap:agricultureLandCoverClass name="H" codeSpace="urn:ec:lpisq: <cap:agricultureLandCoverClass name="T" codeSpace="urn:ec:lpisq: <cap:agricultureLandCoverClass name="S" codeSpace="urn:ec:lpisq: <cap:agricultureLandCoverClass name="P" codeSpace="urn:ec:lpisq: <cap:agricultureLandCoverClass name="R" codeSpace="urn:ec:lpisq: </cap:RP_ELC> <cap:RP_ALF> <cap:landscapeFeature name: <cap:landscapeFeature name: <cap:landscapeFeature name: <cap:landscapeFeature name: <cap:landscapeFeature name: <cap:landscapeFeature name: </cap:RP_ALF> <cap:RP_ELF>0</cap:RP_ELF> <cap:RP_ANF> <cap:artificialSealedSurface abundance="0" /> <cap:forestAndWoodland abundance="0" /> <cap:naturalVegetation abundance="0" /> <cap:waterBodies abundance="0" /> <cap:naturalBareAreas abundance="0" /> <cap:wetland abundance="0" /> </cap:RP_ANF> <cap:RP_CRA> <cap:inabilityToIdentifyLuiBoundaries occurence="false" /> <cap:discontinuity occurence="false" /> <cap:totalAbsenceOfEligibleFeatures occurence="false" /> <cap:multiParcel occurence="false" /> <cap:multiPolygonReferenceParcel occurence="false" /> </cap:RP_CRA> <cap:RP_CRF /> <cap:RP_CNF> <cap:observedToRecordedAreaPercentage>103</cap:observedToRecordedAreaPercentage> <cap:observedRecordedAreaDifference>167</cap:observedRecordedAreaDifference> </cap:RP_CNF> </pre> <p style="text-align: right;">Reference Area = 5300</p>																																																																																	

E2/Area-based conformance check/_c. values not expected

For the inspected parcel with ?inability to identify LUI boundaries = true?, the RP_MEA is correctly set to zero. The measured eligible area = 0. Therefore the observed to recorded area ratio is expected to be = 0%.

```
<cap:RP_MEA>0</cap:RP_MEA>
<cap:RP_ELC/>
<cap:RP_ALF />
<cap:RP_ELF>0</cap:RP_ELF>
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  <cap:artificialSealedSurface abundance="0" />
  <cap:forestAndWoodland abundance="0" />
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  <cap:waterBodies abundance="0" />
  <cap:naturalBareAreas abundance="0" />
  <cap:wetland abundance="0" />
</cap:RP_ANF>
<cap:RP_CRA>
  <cap:inabilityToIdentifyLuiBoundaries occurrence="true" />
  <cap:discontinuity occurrence="false" />
  <cap:totalAbsenceOfEligibleFeatures occurrence="false" />
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  <cap:multiPolygonReferenceParcel occurrence="false" />
</cap:RP_CRA>
<cap:RP_CRF>
  <cap:inabilityToIdentifyLuiBoundaries waived="false" />
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<cap:RP_CNF>
  <cap:observedToRecordedAreaPercentage>126.19</cap:observedToRecordedAreaPercentage>
  <cap:observedRecordedAreaDifference>681</cap:observedRecordedAreaDifference>
</cap:RP_CNF>
```

E3/Contamination based conformance/_a. not recorded

The blue line represents the inspected parcel, yellow line - eligible land. Parcel contamination with artificial sealed surface is expected to be reported.

```
<cap:RP_MEA>12655</cap:RP_MEA>
<cap:RP_ELC>
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  <cap:naturalBareAreas abundance="0"/>
  <cap:wetland abundance="0"/>
</cap:RP_ANF>
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</cap:RP_CNF>
<cap:RP_CNT/>
<cap:RP_CEA>
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  <cap:revisionsOfTheRegulationsWereNotApplied occurrence="false"/>
  <cap:incompleteProcessing occurrence="false"/>
  <cap:erroneousProcessing occurrence="false"/>
  <cap:incompatiblePisDesign occurrence="false"/>
  <cap:observedEligibleAreaIsNotInGacOn20030630 occurrence="false"/>
</cap:RP_CEA>
```



E3/Contamination based conformance/_b. incorrect values recorded

The parcel under inspection is highlighted with a blue line. No contamination is observed and therefore no contamination is expected to be found as ?true? in RP_CNT.

```
<cap:RP_MEA>13300</cap:RP_MEA>
<cap:RP_ELC>
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<cap:RP_ALF />
<cap:RP_ELF>0</cap:RP_ELF>
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  <cap:artificialSealedSurface abundance="0" />
  <cap:forestAndWoodland abundance="0" />
  <cap:naturalVegetation abundance="0" />
  <cap:waterBodies abundance="0" />
  <cap:naturalBareAreas abundance="0" />
  <cap:wetland abundance="0" />
</cap:RP_ANF>
<cap:RP_CRA>
  <cap:inabilityToIdentifyLuiBoundaries occurrence="false" />
  <cap:discontinuity occurrence="false" />
  <cap:totalAbsenceOfEligibleFeatures occurrence="false" />
  <cap:multiParcel occurrence="false" />
  <cap:multiPolygonReferenceParcel occurrence="false" />
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<cap:RP_CRF />
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  <cap:naturalVegetation contamination="true" rpWaived="false" />
  <cap:waterBodies contamination="true" rpWaived="false" />
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  <cap:revisionsOfTheRegulationsWereNotApplied occurrence="false" />
  <cap:incompleteProcessing occurrence="false" />
  <cap:erroneousProcessing occurrence="false" />
  <cap:incompatiblePisDesign occurrence="false" />
  <cap:observedEligibleAreaIsNotInGacOn20030630 occurrence="false" />
</cap:RP_CEA>
```



E4/Presence of non-conformity parcel check/_a. incorrect categorization of the non-conforming reference parcel

The parcel under inspection is not contaminated, area based conformance is well below the thresholds ? the parcel is fully conforming. Therefore the categorization of the non-conforming parcels is not expected to be set to ?true?.

```
<cap:RP_MEA>13300</cap:RP_MEA>
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  <cap:naturalBareAreas abundance="0" />
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<cap:RP_CRA>
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<cap:RP_CRF />
<cap:RP_CNF>
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  <cap:naturalVegetation contamination="true" rpWaived="false" />
  <cap:waterBodies contamination="true" rpWaived="false" />
  <cap:naturalBareAreas contamination="true" rpWaived="false" />
  <cap:wetland contamination="true" rpWaived="false" />
</cap:RP_CNT>
<cap:RP_CEA>
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  <cap:revisionsOfTheRegulationsWereNotApplied occurrence="false" />
  <cap:incompleteProcessing occurrence="false" />
  <cap:erroneousProcessing occurrence="false" />
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</cap:RP_CEA>
```

```

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  <totalAbsenceOfEligibleFeatures occurrence="false"/>
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  <observedRecordedAreaDifference>4</observedRecordedAreaDifference>
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<RP_CEA>
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  <revisionsOfTheRegulationsWereNotApplied occurrence="false"/>
  <incompleteProcessing occurrence="false"/>
  <erroneousProcessing occurrence="false"/>
  <incompatibleLpisDesign occurrence="false"/>
  <observedEligibleAreaIsNotInGacOn20030630 occurrence="false"/>
</RP_CEA>
referenceParcel>

```

E4/Presence of non-conformity parcel check/_b. incorrect lack of categorization of the non-conforming reference parcel

The reference parcel area purity is exceeding the threshold (97% - 103% for this parcel size). The RP_CEA is expected to be categorized.

```

<cap:RP_MEA>57000</cap:RP_MEA>
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  <cap:wetland abundance="0" />
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<cap:RP_CRF />
<cap:RP_CNF>
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  <cap:waterBodies contamination="true" rpWaivered="false" />
  <cap:naturalBareAreas contamination="true" rpWaivered="false" />
  <cap:wetland contamination="true" rpWaivered="false" />
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<cap:RP_CEA>
  <cap:changesOfTheUnderlyingLandWereNotApplied occurrence="false" />
  <cap:revisionsOfTheRegulationsWereNotApplied occurrence="false" />
  <cap:incompleteProcessing occurrence="false" />
  <cap:erroneousProcessing occurrence="false" />
  <cap:incompatibleLpisDesign occurrence="false" />
  <cap:observedEligibleAreaIsNotInGacOn20030630 occurrence="false" />
</cap:RP_CEA>

```

Other issues	Example
G/Number of inspected Reference parcels/_a. determined sample size not reached	-
G/Number of inspected Reference parcels/_b. determined sample size exceeded	-
H/Exchange data preparation/_a. number of invalid GML files	-
H/Exchange data preparation/_b. number of invalid XML files	-
H/Exchange data preparation/_x. other error	-

X/Proper procedure/number of parcels inspected correctly (in screened set)	
--	--

Go forward to [Graphical illustrations](#).

Go backwards to [Table of contents](#).

28 Graphical illustrations 2012

[version 5.2](#)

Graphical illustration

The following articles offer some key LPIS QA concepts through simplified drawings of the Universe of Discourse and the effects and how the features present should be handled in the inspection methodology.

The current section explains

- the concept of the "LUI" as object of inspection for the reference Parcel
- the 5 meter buffer approach in case of un-measurable LUI
- the application of the critical defect "multipolygon"
- illustrated ETS inspection options applied to various field cases
- the use of terrain measurements using GNSS

Go forward to [LUI](#)

Go backwards to [Table of contents](#).

29 Graphical illustration 2012

[version 5.2](#)

Graphical illustration

The following articles offer some key LPIS QA concepts through simplified drawings of the Universe of Discourse and the effects and how the features present should be handled in the inspection methodology.

The current section explains

- the concept of the "LUI" as object of inspection for the reference Parcel
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- the application of the critical defect "multipolygon"
- illustrated ETS inspection options applied to various field cases
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Go forward to [LUI](#)

Go backwards to [Table of contents](#).

30 LUI 2012

version 5.2

NEW ARTICLE

The current article explains

- the concept of the "LUI" as object of inspection for the reference Parcel

30.1 The concept of "LUI"

LUI definition

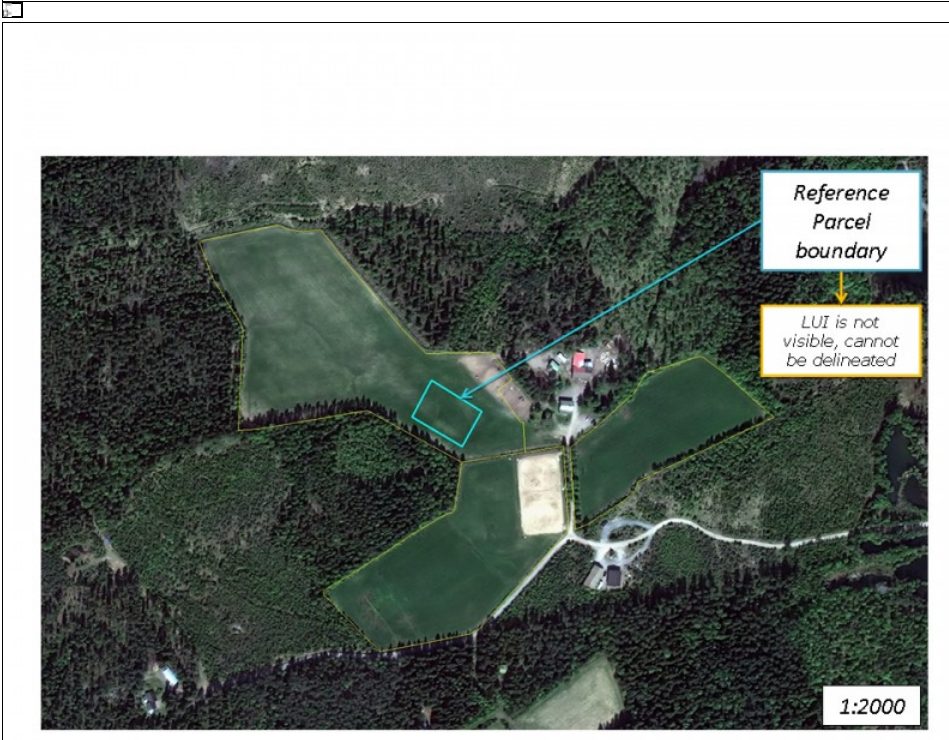
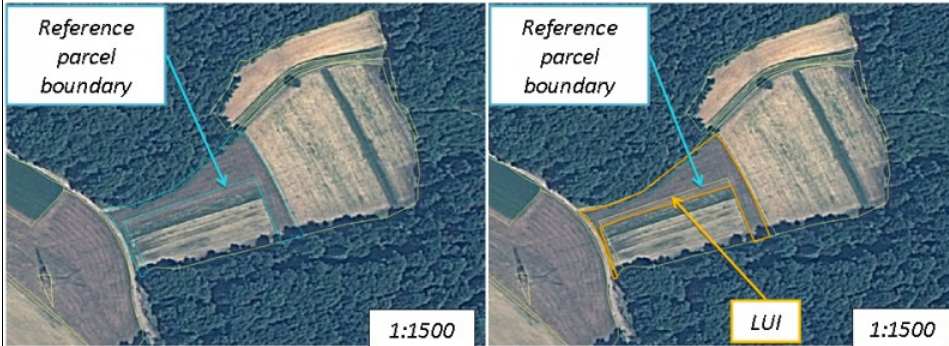
Difference between the Reference Parcel (RP) and the Land Under Inspection (LUI)

Reference Parcel (RP)	Land Under Inspection (LUI)
-The record of a geographically delimited patch of land addressed by a unique identification and holding an official/validated reference area attribute.	-the actual land , visible on the image or on the ground, that is supposed to be represented by the sampled RP (considering proper definition and specifications).
All this information is registered in the GIS in the Member State's LPIS.	This visible land is to be inspected according to ETS procedures, including delineation of the agricultural features present.
See also: ComReg EC No 1122/2009, Art. 2 (27)	See also: ETS ANNEX II

Illustration 1 of the **Reference Parcel Boundary** and the corresponding **Land Under Inspection (LUI)**



Illustration 2 of the **Reference Parcel Boundary** and the corresponding **Land Under Inspection (LUI)**



Go forward to [The concept of the 5 meter buffer](#) to see the details.

Go backwards to [Table of contents](#).

31 5-meter buffer 2012

version 5.2

31.1 Introduction

The current article explains the rationale and theoretical assumptions behind the introduction of the "5 meter buffer" approach in case when the LUI of the reference Parcel is not measurable. In addition, several fictitious examples of particular ETS inspection cases are provided.

31.2 Rationale and theory behind the " 5 meter buffer rule"

5 meter buffer rule

Feasibility for measurement
The rationale behind the 5-meter buffer

paved roads : non-agriculture
Land cover features (image)

RP Boundary (LPIS)

common boundaries of production units (image)

Ambiguity in positional accuracy

- A perfect "visual" match between the RP visualization and the terrain cannot be expected as some misalignment between the RP boundary and the LPIS QA orthoimage will be caused by an inherent planar deviation from the true absolute position between both data sets.

Feasibility for measurement
The rationale behind the 5-meter buffer - 1

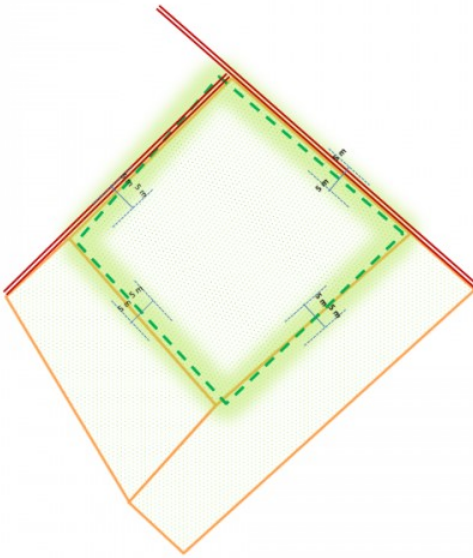
Ambiguity in positional accuracy

- Both LPIS and imagery should comply to the 1:10 000 cartographic standards (2.5 m RMSE), so the deviation in true absolute position from each of the RP vertex to the corresponding photo-identifiable image point can be up of 5 meters (expressed as Circular Error with 90% confidence - CE90).

Feasibility for measurement

The rationale behind the 5-meter buffer - 2

Applying the 5 meter buffer



- As there is no specific quality measure in the LPIS QA for assessing and quantifying the absolute positional accuracy, for pragmatic reasons and simplicity, the ambiguity in the positional misalignment is expressed as a 5 meter buffer both sides of the RP perimeter.
- Thus, only for a land feature that is located outside this perimeter buffer can a determination be made whether this feature should be accounted for the LUI or not.
- By contrast, for a land feature located inside the perimeter buffer (irrespective whether inside or outside the actual RP boundary visualization) no definite decision, whether this feature should be accounted for the LUI or not, can be made unless there is enough evidence to draw a LUI boundary following visual land features in the particular context.
- In case no LUI boundary is drawn, one can only trust the RP perimeter as a substitute for that LUI boundary when absolutely no ineligible feature occur inside the buffer!

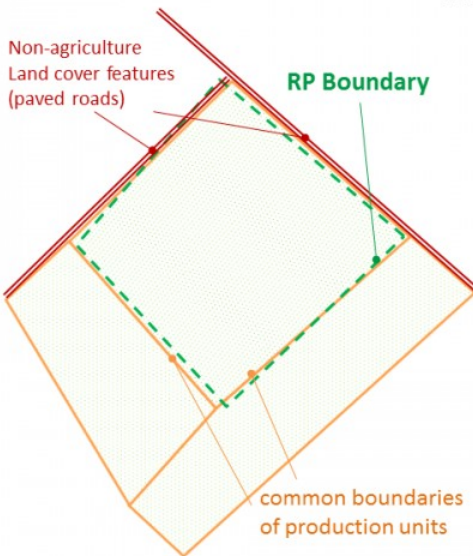
31.3 Examples of implementation of the "5 meter buffer" rule in particular ETS conditions

Case 1: Mappable (measurable) LUI

Feasibility for measurement

Case 1: Mappable (measurable) LUI

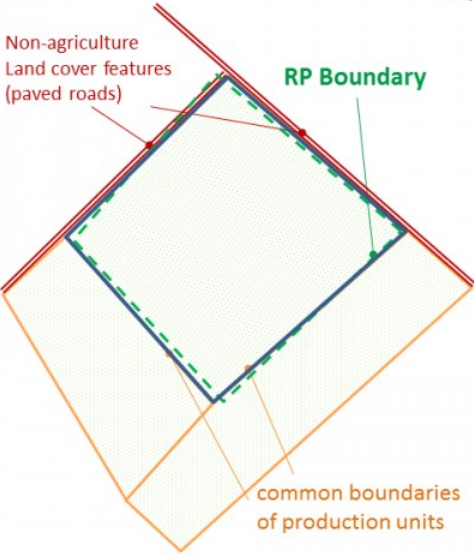
Step 1: Visual analysis of the ground truth



- The Reference Parcel (green dashed line) is "visualized" on the terrain. It is situated next to secondary road network (red double lines) and reflects one of the several production units visible on the land (yellow lines).

Feasibility for measurement
Case 1: Mappable (measurable) LUI

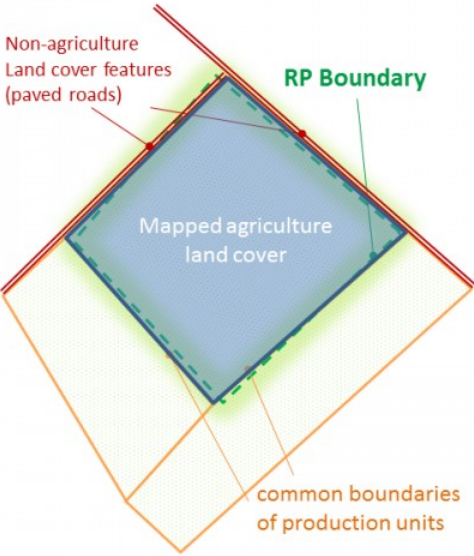
Step 2: Assessment of the LUI mappability



- The visual check of the area in vicinity of the visualised RP boundary on the orthoimage reveals a sufficient availability of distinct land cover and land use features which should be considered to represent all of the LUI perimeter.
- The observed land cover and land use features completely describe and outline the LUI perimeter. These distinct features are:
 - Paved roads (NW and NE boundary);
 - Land use boundaries (SW and SE boundary).

Feasibility for measurement
Case 1: Mappable (measurable) LUI

Step 3: Decision on the LUI mappability



- The ETS measurement can be completed, as each segment of the LUI perimeter can be delineated.

Step 4: check for critical defect

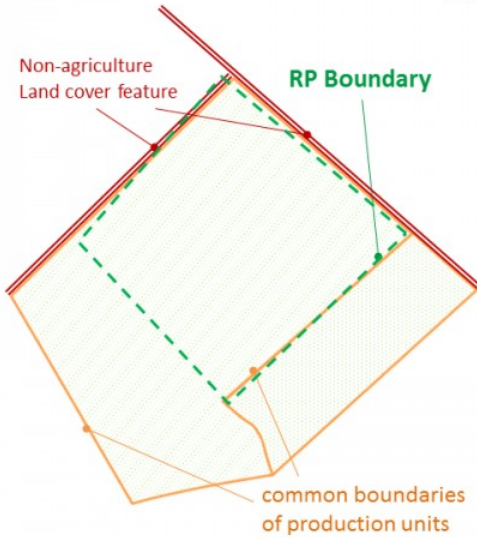
- None of the critical defects is present.

Case 2: Non-Mappable (un-measurable) LUI

Feasibility for measurement

Case 2: Non-Mappable (un-measurable) LUI

Step 1: Visual analysis of the ground truth

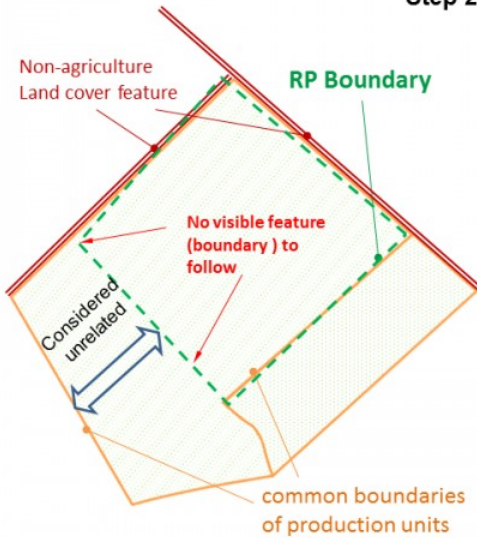


- The Reference Parcel (green dashed line) is “visualized” on the terrain. It is situated next to secondary road network (red double lines) and reflects partly one of the several production units visible on the land (yellow lines).

Feasibility for measurement

Case 2: Non-Mappable (un-measurable) LUI

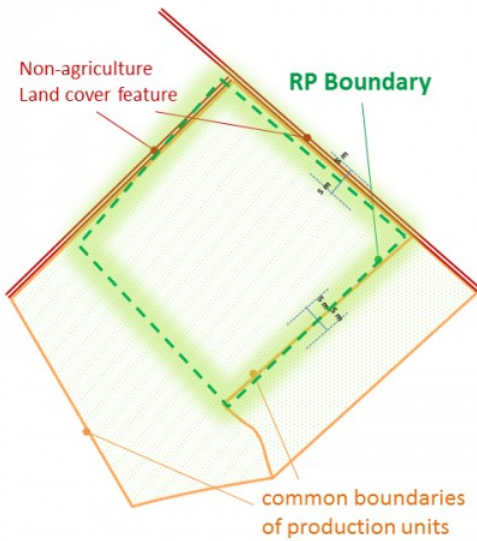
Step 2: Assessment of the LUI mappability



- The visual check of the area in close vicinity to the visualised RP boundary on the orthoimage reveals lack of distinct land cover and land use features that could be considered to represent the SW part of the LUI boundary.
- An essential part of the LUI boundary (SW border) cannot be depicted from the ground data as no boundary feature can be identified.
- The LUI is not fully identifiable.

Feasibility for measurement

Case 2: Non-Mappable (un-measurable) LUI

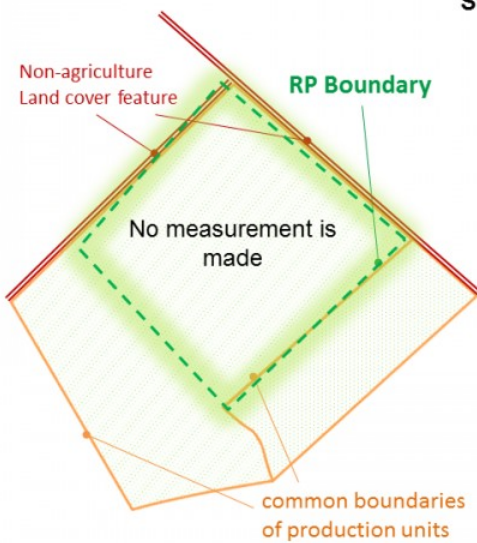


Step 3: Applying the 5 meter buffer

- The visual check of the 5 meter buffer both sides of the RP perimeter, reveals the presence of non-agriculture (ineligible) feature situated less than 5 meters from the RP boundary – the road network.
- There is also a lack of enough evidence to draw a LUI boundary following visual land features in the particular context.
- A definite answer, whether the ineligible features should be accounted for the LUI or not, cannot be given.

Feasibility for measurement

Case 2: Non-Mappable (un-measurable) LUI



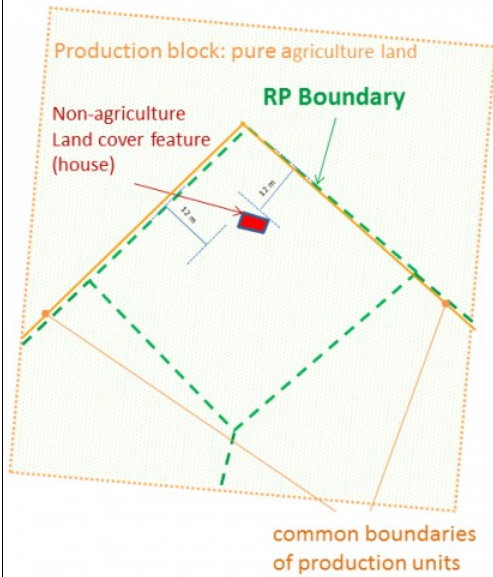
Step 4: Decision on the LUI mappability

- The ETS measurement cannot be performed.
- RP_MEA, Area Declared and Recorded Reference Area are set to zero.

Case 3: Non-Mappable (un-measurable) LUI

Feasibility for measurement

Case 3: Non-Mappable (un-measurable) LUI

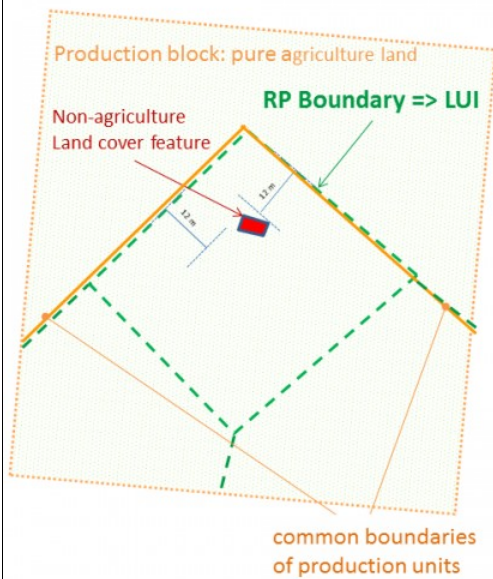


Step 1: Visual analysis of the ground truth

- The Reference Parcel (green dashed line) is “visualized” on the terrain. It reflects partly one of the production units visible on the land (yellow lines).
- A house is located inside the reference parcel at 12 meters from its boundaries.

Feasibility for measurement

Case 3: Non-Mappable (un-measurable) LUI

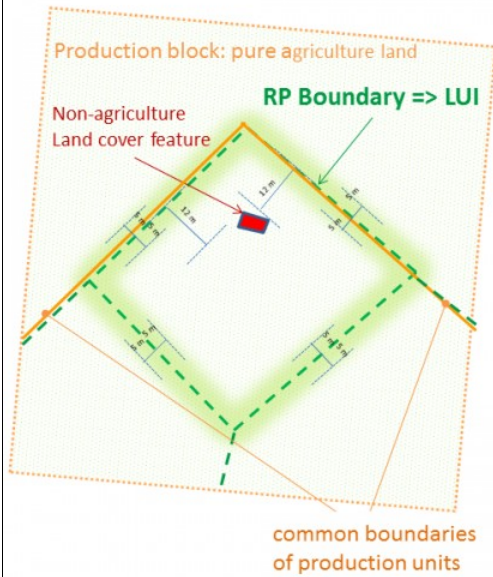


Step 2: Assessment of the LUI mappability

- The visual check of the area in close vicinity to the visualised RP boundary on the orthoimage reveals lack of distinct land cover and land use features that could be considered to represent the Southern part of the LUI boundary.
- An essential part of the LUI boundary (South border) cannot be depicted from the ground data as no boundary feature can be identified.
- The LUI is not fully identifiable.

Feasibility for measurement

Case 3: Non-Mappable (un-measurable) LUI

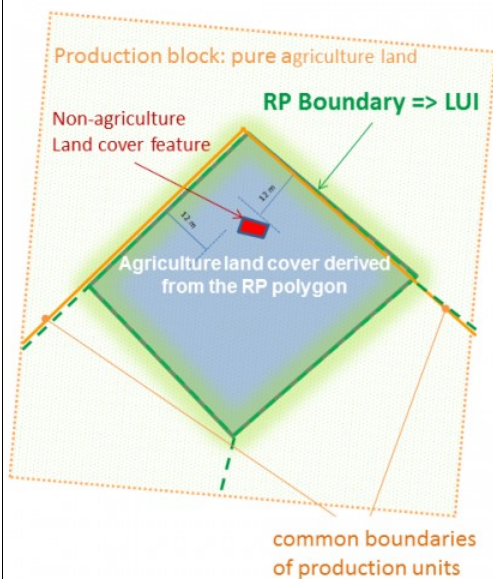


Step 3: Applying the 5 meter buffer

- The visual check of the 5 meter buffer both sides of the RP perimeter, reveals no presence of non-agriculture (ineligible) feature situated less than 5 meters from the RP boundary.
- A definite answer, whether the ineligible features should be accounted for the LUI or not, can be given:
 - The non-agriculture feature is found well inside the LUI and will be excluded from the agriculture area.
- The RP polygon boundary can be taken as a shape of the agriculture land cover available on the LUI.

Feasibility for measurement

Case 3: Non-Mappable (un-measurable) LUI



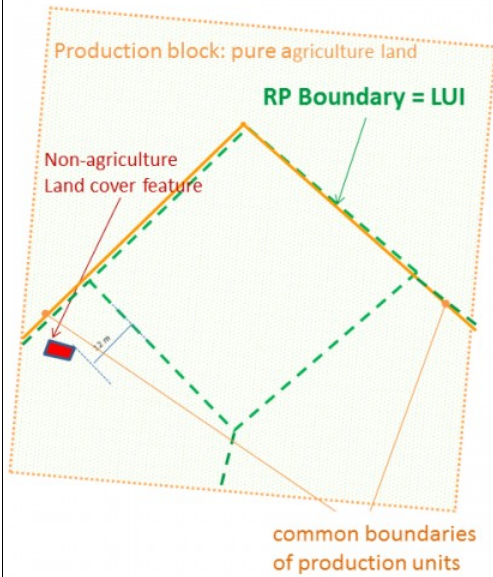
Step 4: Decision on the LUI mappability

- The ETS measurement can be completed, as the available agriculture land can be estimated on the base of the LUI area, directly derived from the visualized RP perimeter, minus the non-agriculture feature which will be deducted.

Case 3b: Non-Mappable (un-measurable) LUI

Feasibility for measurement

Case 3b: Non-Mappable (un-measurable) LUI

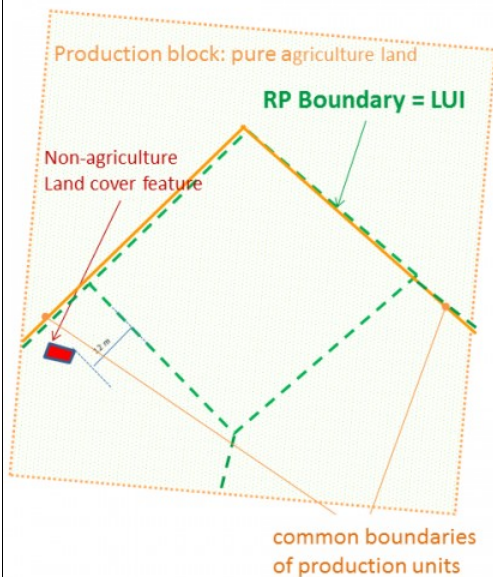


Step 1: Visual analysis of the ground truth

- The Reference Parcel (green dashed line) is “visualized” on the terrain. It reflects partly one of the production units visible on the land (yellow lines).
- A house is located outside the reference parcel at 12 meters from its boundaries.

Feasibility for measurement

Case 3b: Non-Mappable (un-measurable) LUI

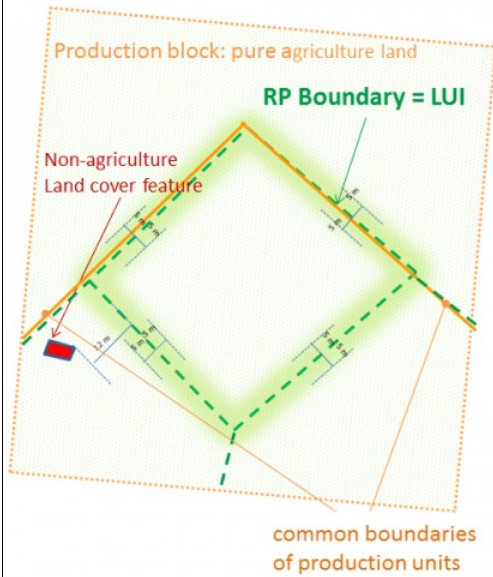


Step 2: Assessment of the LUI mappability

- The visual check of the area in close vicinity to the visualised RP boundary on the orthoimage reveals lack of distinct land cover and land use features that could be considered to represent the Southern part of the LUI boundary.
- An essential part of the LUI boundary (South border) cannot be depicted from the ground data as no boundary feature can be identified.
- The LUI is not fully identifiable.

Feasibility for measurement

Case 3b: Non-Mappable (un-measurable) LUI

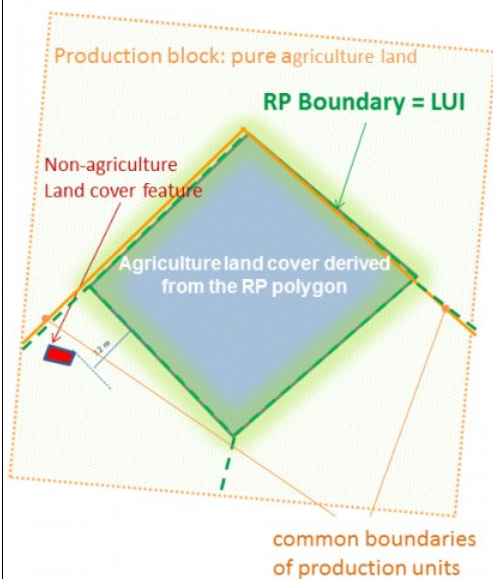


Step 3: Applying the 5 meter buffer

- The visual check of the 5 meter buffer both sides of the RP perimeter, reveals no presence of non-agriculture (ineligible) feature situated less than 5 meters from the RP boundary.
- A definite answer, whether the ineligible features should be accounted for the LUI or not, can be given.
 - The non-agriculture feature is found well outside the LUI and will not be accounted as affecting the agriculture land on the LUI.

Feasibility for measurement

Case 3b: Non-Mappable (un-measurable) LUI



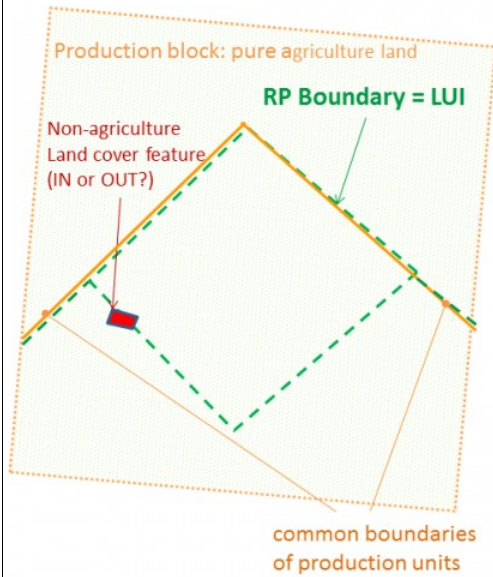
Step 4: Decision on the LUI mappability

- The ETS measurement can be completed, as the available agriculture land can be considered equal to the base to the RP area.

Case 3c: Non-Mappable (un-measurable) LUI

Feasibility for measurement

Case 3c: Non-Mappable (un-measurable) LUI

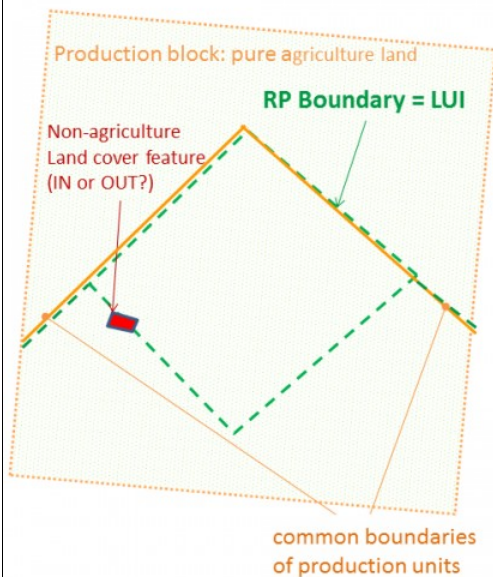


Step 1: Visual analysis of the ground truth

- The Reference Parcel (green dashed line) is “visualized” on the terrain. It reflects partly one of the production units visible on the land (yellow lines).
- A house is located in close vicinity to its boundary (less than 5 meters).

Feasibility for measurement

Case 3c: Non-Mappable (un-measurable) LUI

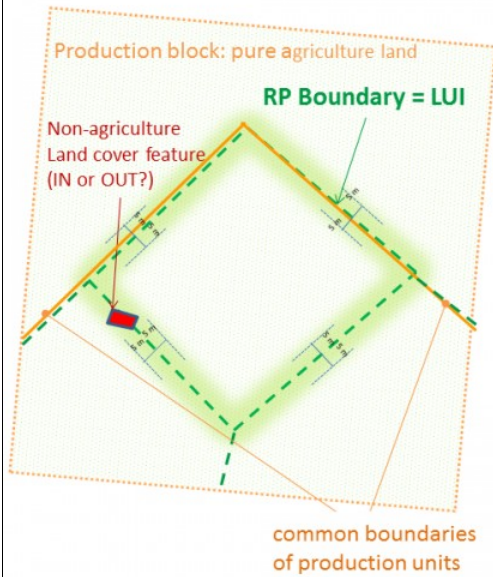


Step 2: Assessment of the LUI mappability

- The visual check of the area in close vicinity to the visualised RP boundary on the orthoimage reveals lack of distinct land cover and land use features that could be considered to represent the Southern part of the LUI boundary.
- An essential part of the LUI boundary (South border) cannot be depicted from the ground data as no boundary feature can be identified.
- The LUI is not fully identifiable.

Feasibility for measurement

Case 3c: Non-Mappable (un-measurable) LUI

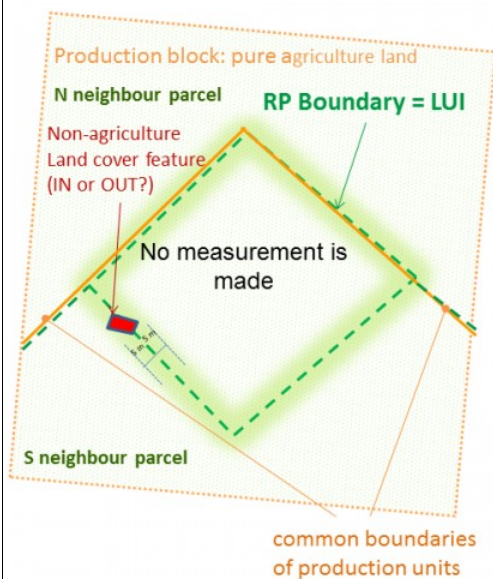


Step 3: Applying the 5 meter buffer

- The visual check of the 5 meter buffer both sides of the RP perimeter, reveals presence of non-agriculture (ineligible) feature situated less than 5 meters from the RP boundary.
- There is also a lack of enough evidence to draw a LUI boundary following visual land features in the particular context.
- A definite answer, whether the ineligible features should be accounted for the LUI or not, cannot be given.
- The area cannot be directly derived from the RP perimeter.

Feasibility for measurement

Case 3c: Non-Mappable (un-measurable) LUI



Step 4: Decision on the LUI mappability

- The ETS measurement cannot be performed.
- RP_MEA, Area Declared and Area Recorded are set to zero.

Step 5: check for critical defects

- None of the conditions for a critical defect seem present

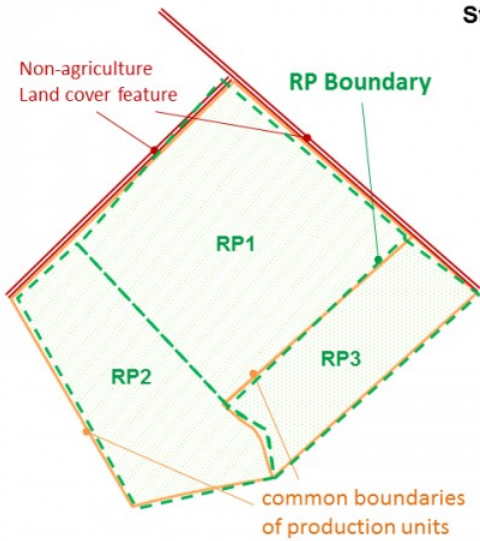
31.4 Additional illustrations of the check for presence of boundary - related critical defects

Cases: Non-Mappable (un-measurable) LUI

Feasibility for measurement

Case 2: Non-Mappable (un-measurable) LUI

Step 5: check for critical defect

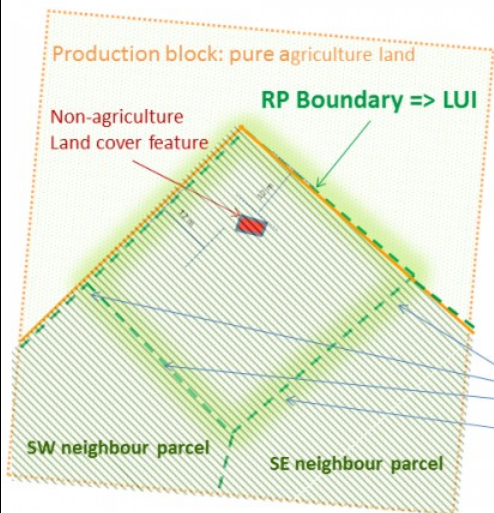


- Although the RP is not measurable, none of the boundary related critical defects is present, as:
 - At least one of the RP perimeter vertices corresponds to observed ground truth;
 - The RP perimeter segment that counter-indicates stable physical boundaries is shared with only one neighbouring RP;
 - The LPIS does contain a neighbouring block where the farmer can declare land upon.

Check for Presence of Critical Defect

Case 3: Non-Mappable (un-measurable) LUI

Step 5: check for critical defect



- In this situation and in the case of a physical or topographical block, clear (green) ploughing lines evidence that the boundaries with both the SW and SE neighbours are no longer valid. If so, "Invalid common boundary" applies, regardless whether the RP is measurable or not.

No single evidence for a presence of a boundary

Go forward to [Measurement, estimation and counting](#).

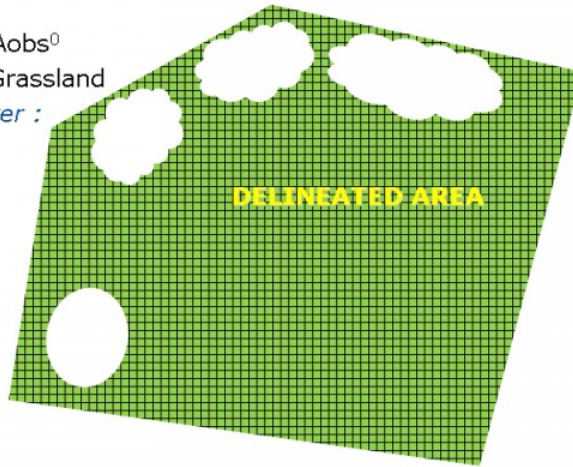
Go backwards to [Table of contents](#).

Mapping – basic

absolute minimum delineation

Reporting

Observed eligible area: A_{obs}^0
 Agriculture land cover: Grassland
 Non-agriculture land cover :
 FOREST: 3
 BARE AREA: 1
 SEALED SURFACE: 1
 WATER BODY: 1



Observed eligible area A_{obs}^0
 =
 Area of the delineated agriculture features
 minus
 Area of the excluded non-agriculture features larger than or equal to 0.1ha through mapping
 minus
 Area of the deducted non-agriculture features smaller than 0.1 ha through estimation

Mapping – variant 1

minimum + delineation of features in the range 0.01 to 0.1 ha

Reporting

Observed eligible area: A_{obs}^1
 Agriculture land cover: Grassland
 Non-agriculture land cover:
 FOREST: 3
 BARE AREA: 1
 SEALED SURFACE: 1
 WATER BODY: 1



Observed eligible area A_{obs}^1
 =
 Area of the delineated agriculture features
 minus
 Area of the excluded non-agriculture features larger than or equal to 0.01ha through mapping
 minus
 Area of the deducted non-agriculture features smaller than 0.01 ha through estimation

$A_{obs}^1 = A_{obs}^0$!

Mapping – variant 2

= minimum + delineation of **all** features less than 0.1 ha

Reporting

Observed eligible area: A_{obs}^2

Agriculture land cover: Grassland

Non-agriculture land cover:

FOREST: 3

BARE AREA: 1

SEALED SURFACE: 1

WATER BODY: 1



Observed eligible area A_{obs}^2
 =
 Area of the mapped agriculture
 features
 minus
 Area of the excluded all non-agriculture
 features through mapping

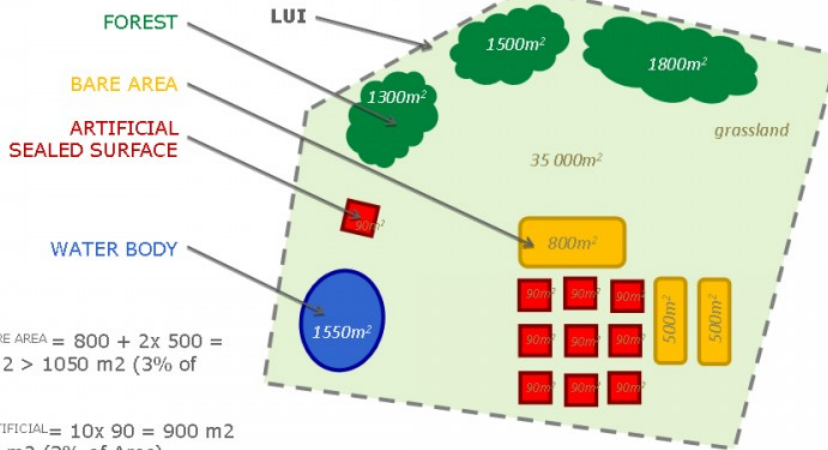
$A_{obs}^2 = A_{obs}^0 !$

32.1.2 Suppose less sealed surface area

Case II: Less sealed surface

Imagine this picture of a slightly different "Real world" (less sealed surface):

(marked areas are unknown prior to inspection)



Area $A_{BARE\ AREA} = 800 + 2 \times 500 = 1800\ m^2 > 1050\ m^2$ (3% of Arec)

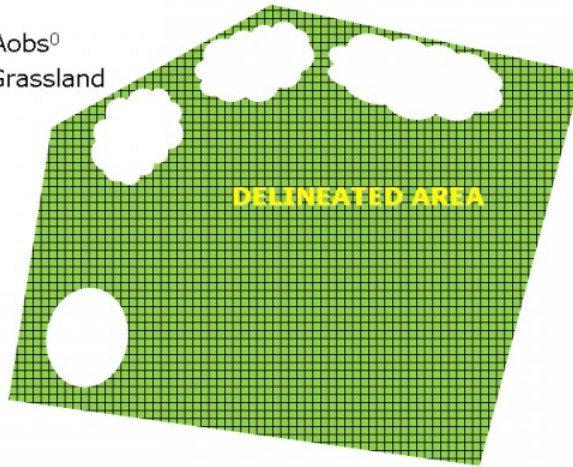
Area $A_{ARTIFICIAL} = 10 \times 90 = 900\ m^2 < 1050\ m^2$ (3% of Arec)

Mapping – basic

absolute minimum delineation

Reporting

Observed eligible area: A_{obs}^0
 Agriculture land cover: Grassland
 NA land cover reported:
 FOREST: 3
 BARE AREA: 1
 SEALED SURFACE: 0
 WATER BODY: 1



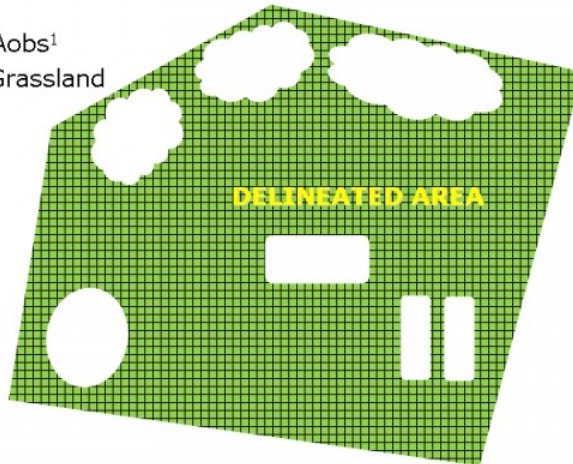
Observed eligible area A_{obs}^0
 =
 Area of the delineated agriculture features
 minus
 Area of the excluded non-agriculture features larger than or equal to 0.1ha through mapping
 minus
 Area of the deducted non-agriculture features smaller than 0.1 ha though estimation

Mapping – variant 1

minimum + delineation of features in the range of 0.01 to 0.1 ha

Reporting

Observed eligible area: A_{obs}^1
 Agriculture land cover: Grassland
 NA land cover:
 FOREST: 3
 BARE AREA: 1
 SEALED SURFACE: 0
 WATER BODY: 1



Observed eligible area A_{obs}^1
 =
 Area of the mapped agriculture features
 minus
 Area of the excluded non-agriculture features larger than or equal to 0.01ha through mapping
 minus
 Area of the deducted non-agriculture features smaller than 0.01 ha though estimation

$A_{obs}^1 = A_{obs}^0$!

CASE II

Mapping – variant 2

minimum + delineate **all** features less than 0.1 ha

Reporting

Observed eligible area: A_{obs}^2

Agriculture land cover: Grassland

Non-agriculture land cover:

FOREST: 3

BARE AREA: 1

SEALED SURFACE: 0

WATER BODY: 1



Observed eligible area A_{obs}^2
 =
 Area of the mapped agriculture
 features
 minus
 Area of the excluded all non-agriculture
 features through mapping

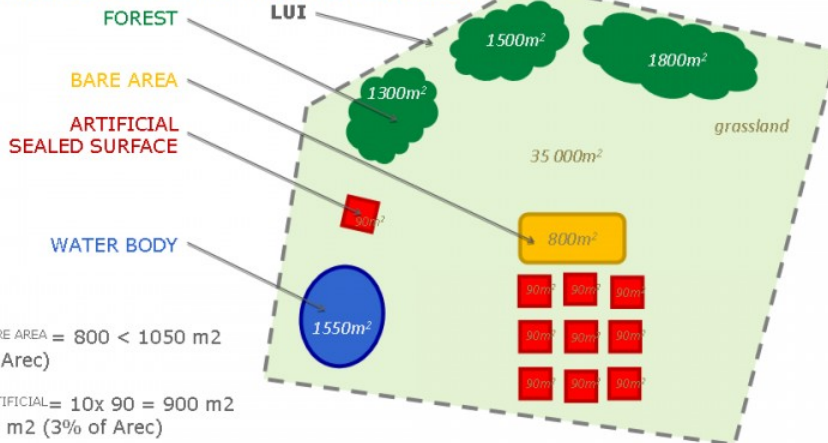
$A_{obs}^2 = A_{obs}^0 !$

32.1.3 Suppose less sealed surface and less bare area

Case III: Less sealed surface, less bare area

CASE III

Imagine yet another slightly different picture of the real world
 (less sealed surface and less bare area)
 (Marked areas are unknown prior to inspection)



Area $A_{BARE AREA} = 800 < 1050 \text{ m}^2$
 (3% of A_{rec})

Area $A_{ARTIFICIAL} = 10 \times 90 = 900 \text{ m}^2$
 < 1050 m^2 (3% of A_{rec})

Mapping - basic

Required at minimum

Reporting

Observed eligible area: A_{obs}^0

Agriculture land cover: Grassland

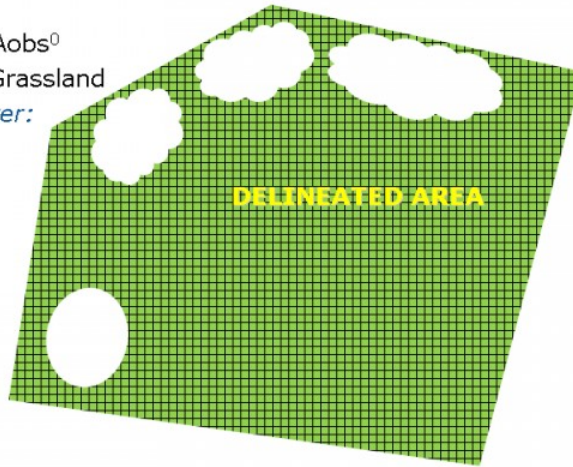
Non-agriculture land cover:

FOREST: 3

BARE AREA: 0

SEALED SURFACE: 0

WATER BODY: 1



Observed eligible area A_{obs}^0
 =
 Area of the delineated agriculture features
 minus
 Area of the excluded non-agriculture features larger than or equal to 0.1ha through mapping
 minus
 Area of the deducted non-agriculture features smaller than 0.1 ha through estimation

Mapping - variant 1

minimum + delineation of features in the range of 0.01 to 0.1 ha

Reporting

Observed eligible area: A_{obs}^1

Agriculture land cover: Grassland

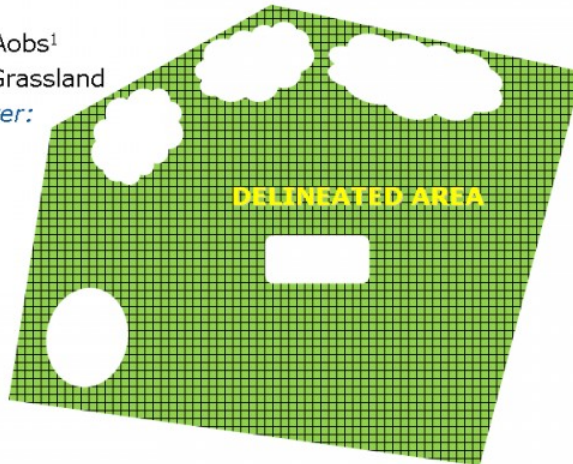
Non-agriculture land cover:

FOREST: 3

BARE AREA: 0

SEALED SURFACE: 0

WATER BODY: 1



Observed eligible area A_{obs}^1
 =
 Area of the delineated agriculture features
 minus
 Area of the excluded non-agriculture features larger than or equal to 0.01ha through mapping
 minus
 Area of the deducted non-agriculture features smaller than 0.01 ha through estimation

$A_{obs}^1 = A_{obs}^0 !$

CASE III

Mapping – variant 2

minimum + delineation of **all** features less than 0.1 ha

Reporting

Observed eligible area: A_{obs}^2

Agriculture land cover: Grassland

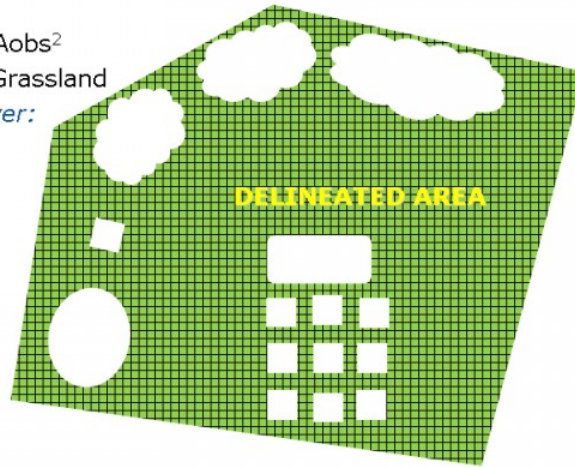
Non-agriculture land cover:

FOREST: 3

BARE AREA: 0

SEALED SURFACE: 0

WATER BODY: 1



Observed eligible area A_{obs}^2

equals

Area of the mapped agriculture features

minus

Area of the excluded all non-agriculture features through mapping

$$A_{obs}^2 = A_{obs}^0 !$$

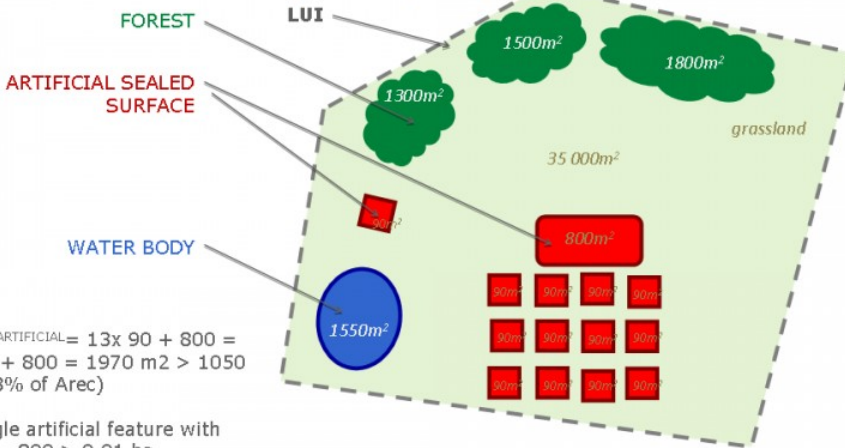
32.1.4 Suppose no bare area and more sealed surface

Case IV: No bare area, more sealed surface

CASE IV

A last picture of the real world in our universe of discourse (no bare area, more sealed surface)

(Marked areas are unknown prior to inspection)



$$\text{Area}_{\text{ARTIFICIAL}} = 13 \times 90 + 800 = 1170 + 800 = 1970 \text{ m}^2 > 1050 \text{ m}^2 \text{ (3\% of Arec)}$$

1 single artificial feature with Area = 800 > 0.01 ha

Mapping - basic

Required at minimum

Reporting

Observed eligible area: A_{obs}^0

Agriculture land cover: Grassland

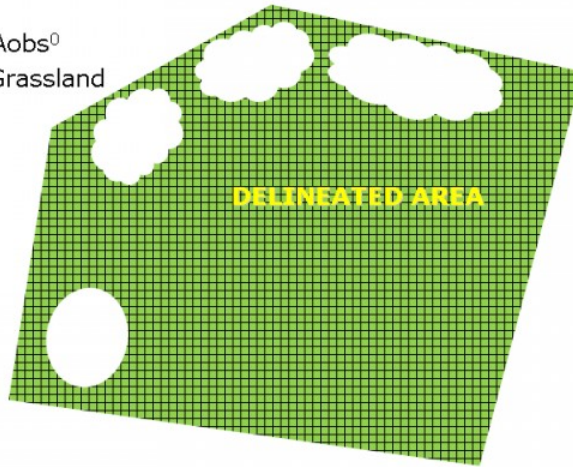
NA land cover:

FOREST: 3

BARE AREA: 0

SEALED SURFACE: 2

WATER BODY: 1



Observed eligible area A_{obs}^0

equals

Area of the mapped agriculture features

minus

Area of the excluded non-agriculture features larger than or equal to 0.1ha through mapping

minus

Area of the deducted non-agriculture features smaller than 0.1 ha through estimation

Mapping - variant 1

minimum + features in the range of 0.01 to 0.1 ha

Reporting

Observed eligible area: A_{obs}^1

Agriculture land cover: Grassland

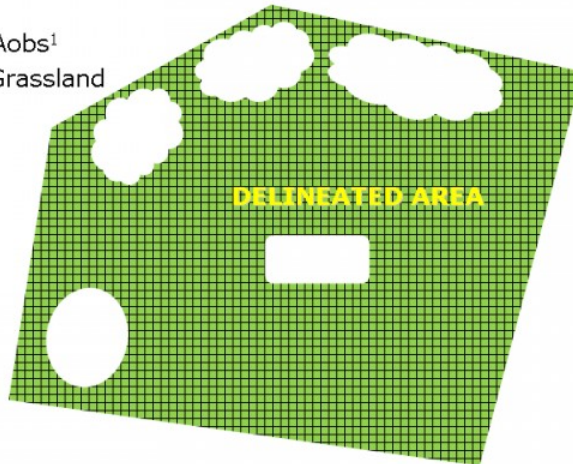
NA land cover:

FOREST: 3

BARE AREA: 0

SEALED SURFACE: 2

WATER BODY: 1



Observed eligible area A_{obs}^1

equals

Area of the mapped agriculture features

minus

Area of the excluded non-agriculture features larger than or equal to 0.01ha through mapping

minus

Area of the deducted non-agriculture features smaller than 0.01 ha through estimation

$A_{obs}^1 = A_{obs}^0 !$

Mapping – variant 2

minimum + delineation of **all** features less than 0.1 ha

Reporting

Observed eligible area: A_{obs}^2

Agriculture land cover: Grassland

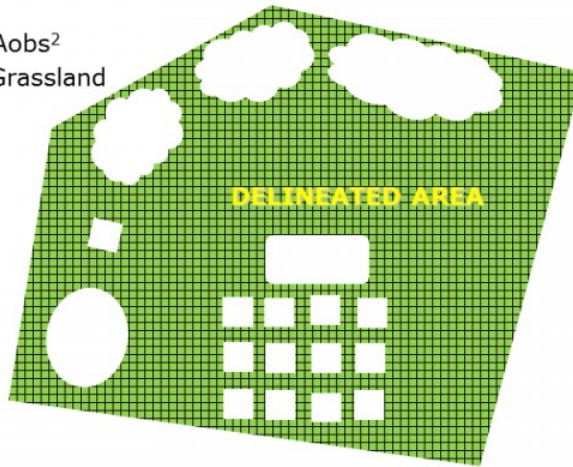
NA land cover :

FOREST: 3

BARE AREA: 0

SEALED SURFACE: 2

WATER BODY: 1



Observed eligible area A_{obs}^2

equals

Area of the mapped agriculture features

minus

Area of the excluded all non-agriculture features through mapping

$A_{obs}^2 = A_{obs}^0 !$

Go forward to [Border features and contamination](#)

Go backwards to [Table of contents](#).

33 Border features and contamination 2012

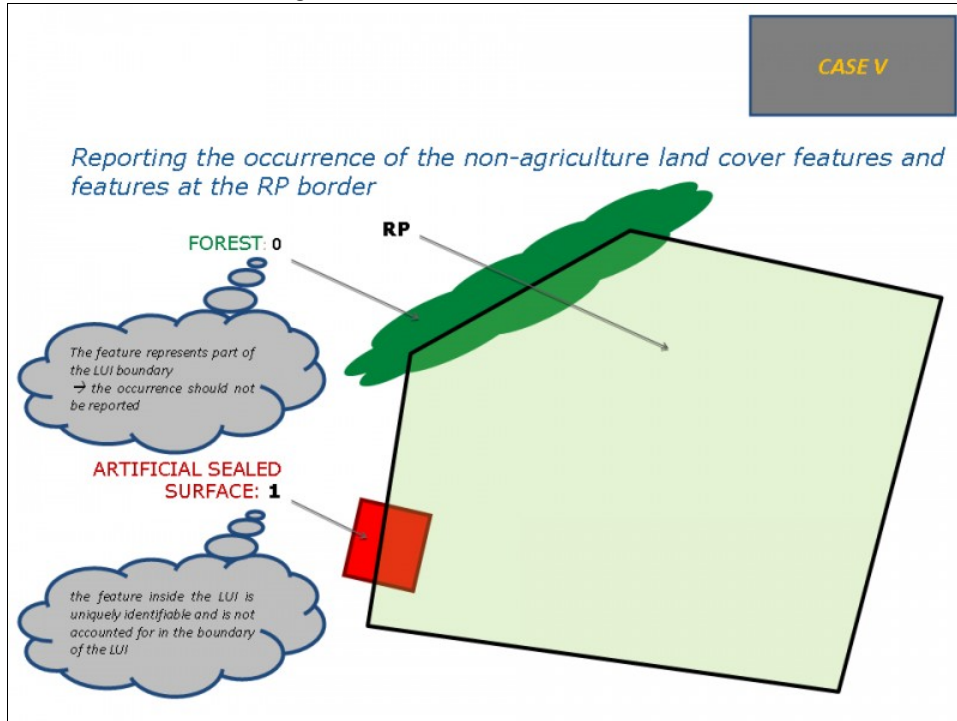
version 5.2

NEW ARTICLE

33.1 Reporting non-agricultural features located on the boundary

See also the 5-meter buffer

Case V: Forest and a building



33.2 Reporting contamination on an area-conforming reference parcel

Non-agricultural land cover features are considered "contamination" when they are:

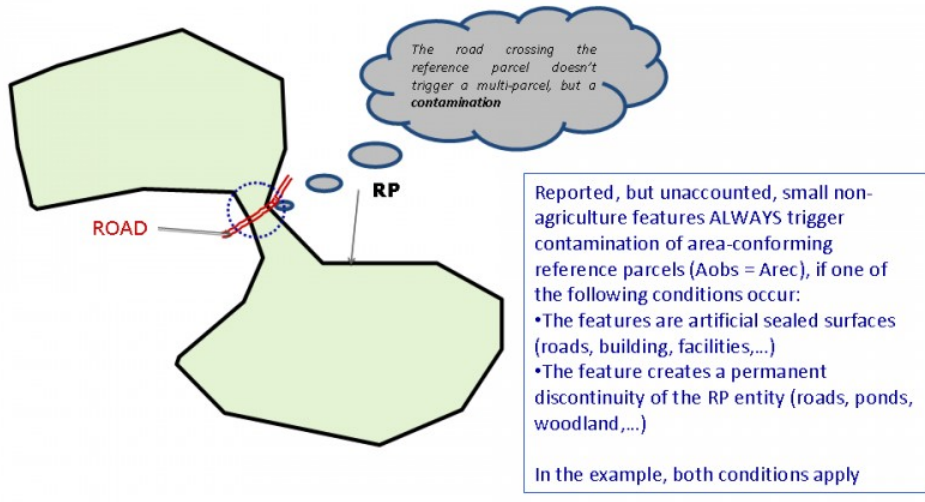
1. unaccounted for by lack of internal LPIS evidence (see the waivers C and D in Annex I)
2. are partly or totally located inside the LUI

NOTE: For the latter: this must be considered AFTER applying the 5-meter buffer rule, one cannot apply the 5-meter buffer rule independently on the feature.

Case VI: Road

CASE VI

Reporting the occurrence of the non-agriculture land cover features – features crossing the entity of a conformant reference parcel



Go forward to [Multi-parcel and multi-polygon](#)

Go backwards to [Table of contents](#).

34 Multi-parcel and multi-polygon 2012

version 5.2

NEW ARTICLE

34.1 Multi-parcels

A Multi-parcel critical defect is detected when (production) block reference parcels (AP/FB/TB//PB) are an amalgamate of 10 (ten) or more clearly distinct parcels (i.e. units of agriculture land which according to the internal rules should have been processed separately).

This relates to a situation where the reference parcel aggregates/joins what should be separate RP parcels according to the intrinsic definition/specification used in the LPIS.

The following fictitious example uses the same field, but modelled by AP, FB or PB/TB LPIS designs.

The region of interest



34.1.1 Agricultural parcel design

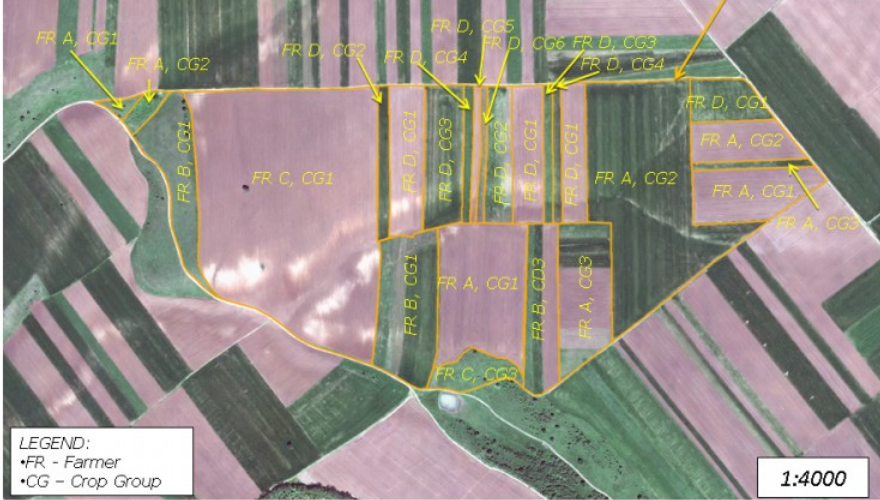
Agricultural parcel design

Agricultural parcel

Type of RP	Agricultural parcel	Farmer's block	Physical block / TopoBlock
land use for aid scheme	one single crop group	one or several crop groups	one or several crop groups
applicants	single farmer	single farmer	one or several farmers
temporal aspect	annual	multi-annual	semi-permanent
main data source	farmer's application	farmer's survey	administration survey

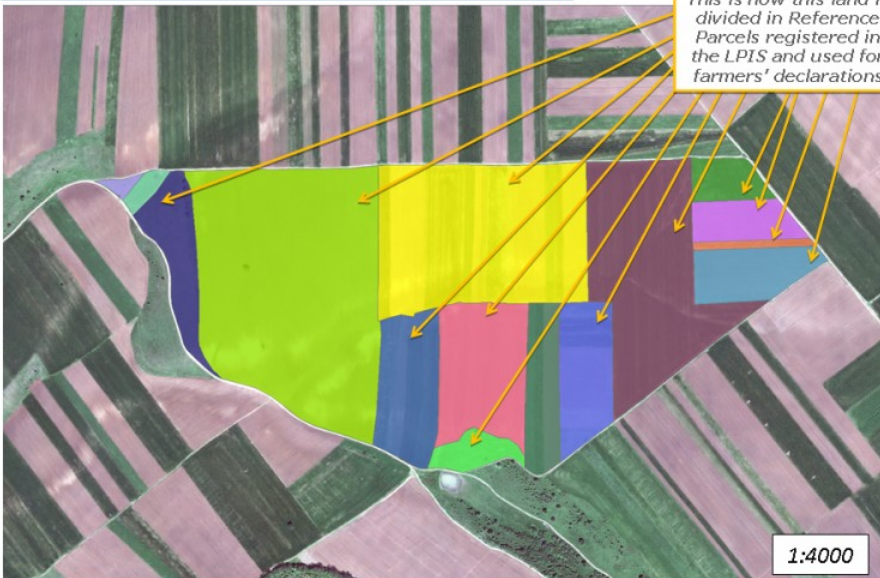
CONCEPTUAL EXAMPLE, CASE I: agricultural parcel

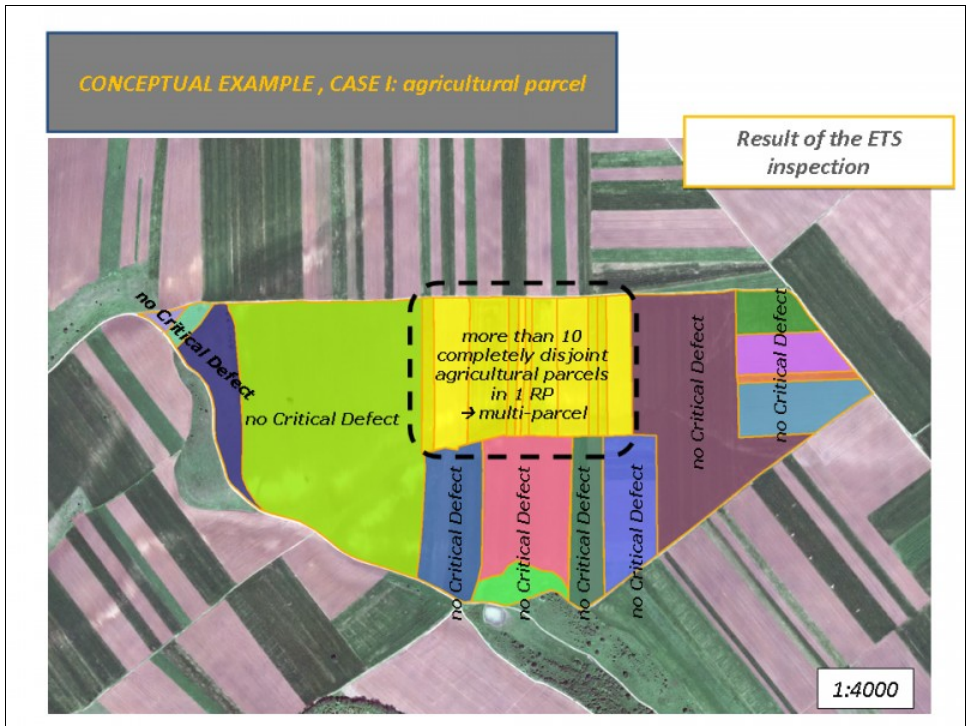
This is how the Reference Parcels are supposed to be registered in an LPIS based on agriculture parcels



CONCEPTUAL EXAMPLE, CASE I: agricultural parcel

This is how this land is divided in Reference Parcels registered in the LPIS and used for farmers' declarations





34.1.2 Farmer's block design

Farmer's block design

Farmer's block

Type of RP	Agricultural parcel	Farmer's block	Physical block / TopoBlock
land use for aid scheme	one single crop group	one or several crop groups	one or several crop groups
applicants	single farmer	single farmer	one or several farmers
temporal aspect	annual	multi-annual	semi-permanent
main data source	farmer's application	farmer's survey	administration survey

CONCEPTUAL EXAMPLE, CASE II: farmer's block



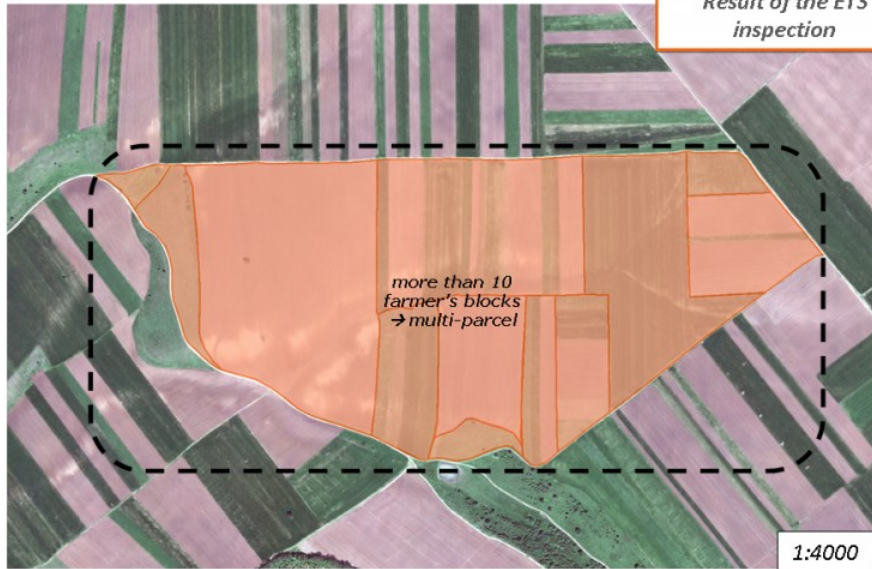
This how the Reference Parcels are supposed to be stored in the LPIS system, based on farmer's block: IRP = continuous production block by 1 farmer

CONCEPTUAL EXAMPLE, CASE II: farmer's block



There is a single Reference Parcel registered in the LPIS

CONCEPTUAL EXAMPLE, CASE II: farmer's block



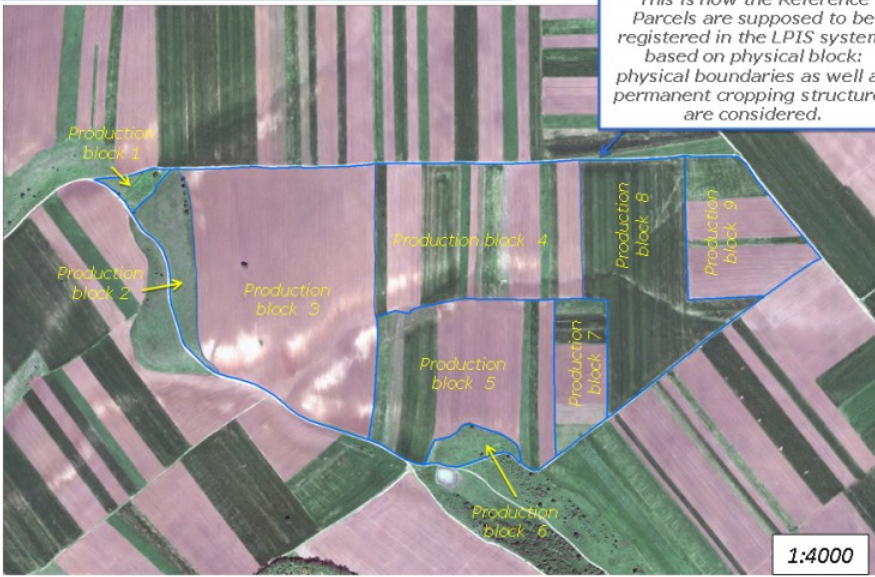
34.1.3 Physical or topographical block design

Physical / topographical block design

Physical block

Type of RP	Agricultural parcel	Farmer's block	Physical block/ TopoBlock
land use for aid scheme	one single crop group	one or several crop groups	one or several crop groups
applicants	single farmer	single farmer	one or several farmers
temporal aspect	annual	multi-annual	semi-permanent
main data source	farmer's application	farmer's survey	administration survey

CONCEPTUAL EXAMPLE , CASE IV: physical block

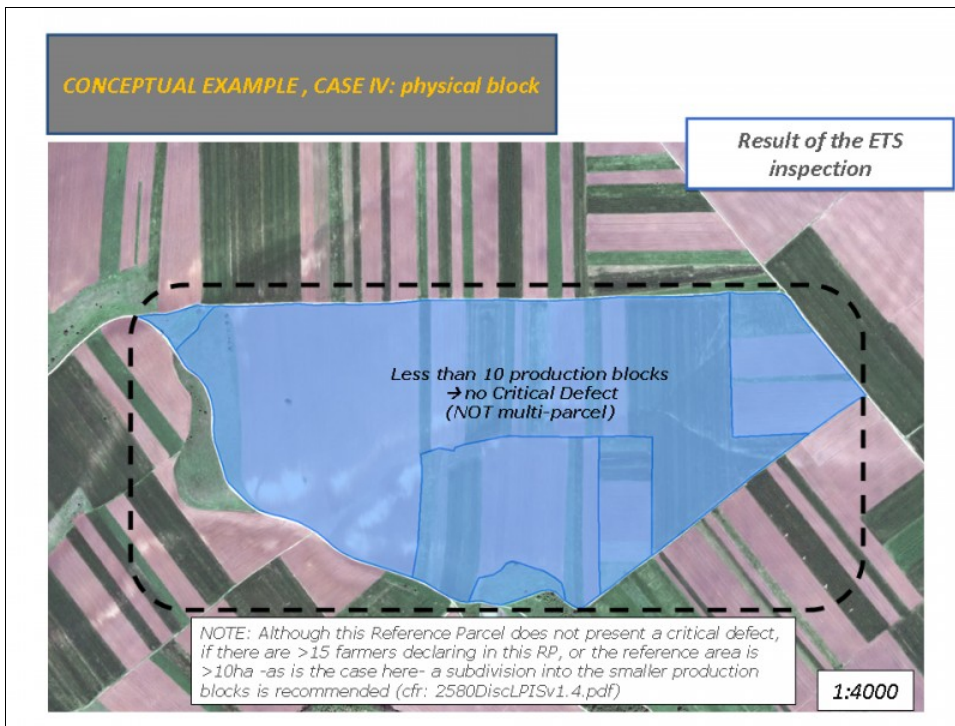


This is how the Reference Parcels are supposed to be registered in the LPIS system, based on physical block: physical boundaries as well as permanent cropping structures are considered.

CONCEPTUAL EXAMPLE , CASE IV: physical block



This is how the Reference Parcels are stored in the LPIS system

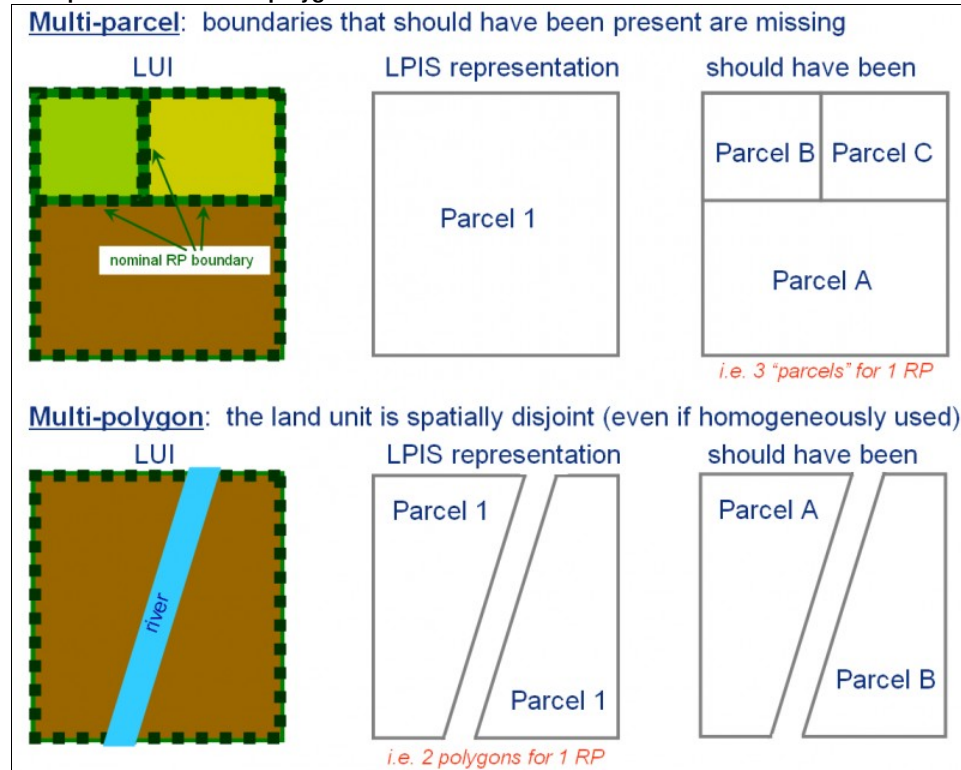


34.2 Multi-polygons

The difference between the two defects is

- ◊ **multi-parcel**: a situation where the reference parcel aggregates/joins what should be separate RP parcels according to the intrinsic definition/specification used in the LPIS. It could result from any cause besides upgrade
- ◊ **multi-polygon**: a situation where a single identified "unit" of land (i.e. one parcel-ID) relates to two or more distinct/disjunct plots in the field. It could result from erroneous processing or incompatible LPIS design

Multi-parcel versus Multi-polygon



Go forward to [Field Survey inspections](#)

Go backwards to [Table of contents](#).

35 Boundary inspection 2012

version 5.2

35.1 Introduction

This article provides methodological guidance on the supplementary GNSS point boundary measurements that the ETS operator could conduct

1. mandatorily when a field inspection is performed for the collection of the first vertex of the LUI perimeter
2. optionally in cases where ~~the LUI boundary cannot be (fully) depicted using CAPI and~~ a critical defect can be vindicated.

The resulting GNSS measurements should provide respectively:

- an observation for the first vertex the LUI perimeter of the reference parcel that was considered not measurable with CAPI but where the inspector proceeded with a field measurement of the LUI boundary (i.e. he should provide the coordinates + pictures + metadata of the first vertex in addition to the field measured vertices that are reported in the ETS_Measurement.gml),
- or an evidence against the ~~"invalid perimeter"~~ defect (i.e. return at least one GNSS point: coordinates + pictures + metadata).

CONDITIONS:

1. The MS decision whether to verify critical defects in the field or not is completely discretionary.
2. In case the ETS operator proceeds with a field inspection of the parcel, field evidence that the First vertex of the LUI perimeter is identifiable, should be given.
3. Using GNSS survey for field inspection implies that the entire land cover inventory should be made exclusively by field survey. No mixture of GNSS and CAPI measurements is allowed.

35.2 Set up the GNSS device correctly --> link to OTSC stop&go

- The measurement of the parcel should be performed by using validated device for stop&go method.
- During the measurement, the user should be aware of the possible difficulties that may jeopardize correct measurement, such as loss of satellite signal, multi-path effect etc. Some of these difficulties can be reduced by an appropriate set up of parameters like:

- ◊ signal to noise ratio (S/N),
- ◊ maximum PDOP and horizontal mask

These parameters should be the same as for any OTSC stop&go measurement.

35.3 Identify the RP vertex to be measured

The inspector should make sure he correctly identified the vertex of parcel he is going to survey based on the presence of a borderstone or some other boundary mark. This mark must physically exist in the field.

- For each coordinate surveyed by GNSS, two photographs (with a recommended angle between the two camera directions of 60°-120°) of the LUI observed vertex ground condition should be taken. It is necessary to survey the coordinates of the two camera points from where the inspector took a photographic picture of the LUI vertex.

For each observed vertex, three GNSS coordinates are needed (1 for the vertex, 2 for the camera positions).

As the vertex that ETS inspector intends to survey already has a known coordinate (from the LPIS), that known coordinate shall be used as auxiliary data only, e.g. to navigate to the true point position in the field; the inspector must perform an new and independent coordinate survey of each vertex.

In such independent survey, there can be **no application of a buffer or other tolerance** regarding the observed coordinates.

35.4 Determine the required number of point observations

The inspector needs to collect as many points as needed to collect clear evidence

- one point per parcel is needed for
 1. the first vertex of any field inspection
 2. any perimeter point to vindicate the critical defect "invalid perimeter"
- two points are appropriate for
 1. vindicate "open block" or "invalid common boundary" critical defects
 2. and this for each occurrence of the defect
- more points are appropriate only in complex cases, there is currently no predefined guideline.

35.5 Collect pictures and metadata

NOTE: the illustration below provide situation where the options for each point of the (LUI perimeter) is observed. The survey of all vertices is however not necessary. The required number of points is defined above.

For each surveyed vertex, 4 photographic pictures are delivered

- ◇ 2 captured from the vertex. (wide blue arrows in Figure 1, these have the coordinates of the vertex itself)
- ◇ 2 captured towards/showing the vertex. (thin red arrows in Figure 2, these are the ones with individual coordinates as indicated above).

In the diagrams below, each observed vertex is identified with a code PV<1..n>.

- ◇ for evidencing a full field measurement, <n> equals "1",
- ◇ for vindicating a critical defect, <n> equals the number of observed vertices of the LUI.

35.5.1 Take pictures from the parcel vertex

On each vertex surveyed, two photographic pictures should be captured, one in clockwise direction toward neighboring vertex and one to the interior of the parcel. For the captured pictures, the direction of capturing (azimuth) is needed for georeferencing. Pictures should be in jpeg format (with date/time stamp) and a name composed by the observed vertex ID (as prefix) and the sequential number of the picture (eg. PV1_n.jpg, 24bit RGB, 720x480).

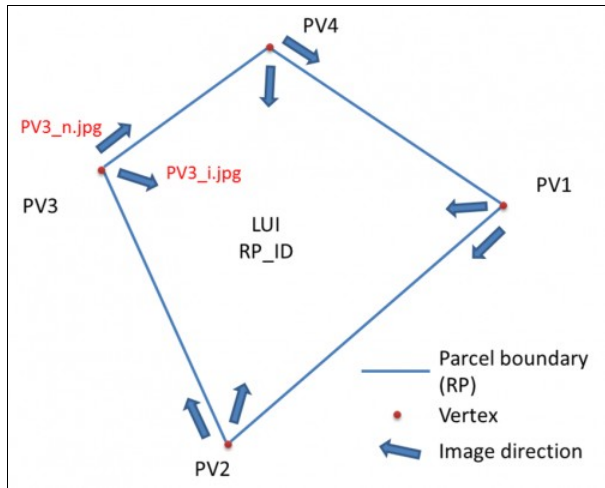


Figure 1. Capturing pictures from a parcel vertex.

fid	geometryProperty	rpID	...	boundaryInspectionDate	responsibleOperator	photoStorageLocation	photoDirectionAzimuth
PV1	12.97,44.29	P011-K7		2011-10-01	Mr Adam Smith			PV1_n.jpg	angle
PV1	12.97,44.29	P011-K7		2011-10-01	Mr Adam Smith			PV1_i.jpg	angle

Table 1. Boundary point measurements (extract from the GML of the Boundary inspection).

Explanation for naming image files:

- PV1_n.jpg - picture in direction of neighboring vertex
- PV1_i.jpg ? picture in direction to the interior of the parcel

35.5.2 Take pictures of/showing the parcel vertex

For each vertex two additional images should be captured. It is very important that the mark (stone or other) of parcel boundary corner is visible on image. The angle between two image directions should be in range 60°-120° (recommendation).

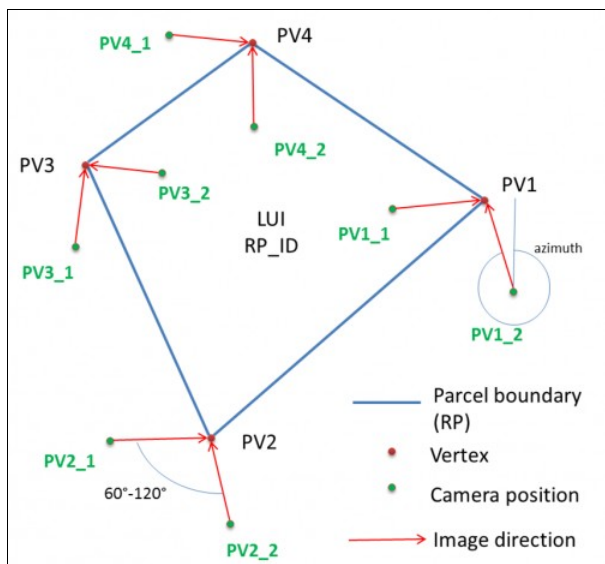


Figure 2. Capturing pictures of a parcel vertex.

fid	geometryProperty	rplD	...	boundaryInspectionDate	responsibleOperator	photoStorageLocation	photoDirectionAzimuth
PV1	12.97,44.29	P011-K7		2011-10-01	Mr Adam Smith			PV1.jpg	angle
PV1_1	13.01,44.27	P011-K7		2011-10-01	Mr Adam Smith			PV1_1.jpg	80 degrees N
PV1_2	15.97,47.29	P011-K7		2011-10-01	Mr Adam Smith			PV1_2.jpg	350 degrees N

Table 2. Boundary inspection measurements (extract from the GML of the Boundary inspection).

35.6 Report your field activities in the ICS

The ICS informative textual part (as a supportive document) should indicate your choice to complement the CAPI with field surveys. **Please add the following entries in the ICS** (replace the *"italics"* with the appropriate information) :

- Motivation for the Boundary inspection: *"RP boundary based on cadastre is not always visible on the control imagery, but physical border markers are traditionally present."*
- Type of GNSS device(s): *"TOPCON GRS-1 with Trimble VRS DGPS real time correction"*
- Positional accuracy (RMSE_x; RMSE_y): *"0.37; 0.46"*

35.7 Transform the data in the correct exchange format

Apart of its traditional purpose, the Boundary inspection schema shall allow for storing the complex GNSS measurements made in the field, following a simple convention: please look at Figure 1 and Figure 2 and a downloadable example [BoundaryInspection.gml](#).

Element name	Description
<cap:boundaryInspection fid="">	a unique identifier of the LUI observed Vertex (PV1) or a unique identifier of point documenting the observed Vertex (PV1_1) from which a photo was acquired
<cap:geometryProperty>	point-type geometry with an SRS and coordinates
<cap:rplD>	a unique identifier of a reference parcel represented by LUI
<cap:reasonboundaryInspection>	a reason for that particular Field Visit, i.e. to prove the location of the observed vertex, or to prove the existence of a observed vertex with a photo
<cap:boundaryInspectionDate>	a date of the field visit
<cap:responsibleOperator>	an operator who conducted the measurements
<cap:agricultureLandCoverClass>	an optional element storing agriculture land cover class
<cap:comments>	comments (could be used to explain the type of landmark representing the LUI vertex)
<cap:photoStorageLocation>	an URL of the photo location
<cap:photoDirectionAzimuth>	a direction azimuth in which the photo was acquired

Table 3. Elements present in the Boundary inspection schema.

Go forward to [Field observations](#).

Go backwards to [Table of contents](#).

36 Field observations 2012

version 5.2

NEW ARTICLE

36.1 Introduction

The purpose of this article is to provide methodological guidance on the supplementary field observation (formerly called rapid field visits) that can be conducted in those where the nature and type of land features present on the ground cannot be (fully) established by CAPI.

Field observations (FO) are designed to quickly perform a visual check and eventually to confirm certain characteristics of the LUI, such as:

- Exact type of the land cover (on condition that the extent of the LUI was determined already by CAPI);
- Exact type of landscape features already detected;
- Parameters regarding the application of pro-rata concepts;
- Any other visual observation, relevant to the ETS (for example, evidence for critical defects)

Field observations are thus triggered in cases when the ETS operator can delineate properly the land cover features using CAPI. **FO does not involve ? a priori- any area measurements or precise point collection of LUI vertices through GNSS.** However, they usually imply collection of geo-located pictures as supportive evidence.

36.2 Phases of the Field observation

36.2.1 Preparation work

- Decide to make a field observation ? the delineation of the parcel is done but it is not possible to exactly determine the land cover and landscape features. (one clearly sees there is something on the image, but it's not completely clear what)
- Prepare the field observation data collection
 - ◆ Use maps for the overall location of the parcels (the current orthoimage) and overlap with parcel boundaries
 - ◆ Consult the eligibility profile
 - ◆ Implement GPS or system allowing the display of images, vectors and data on a mobile computer in the field may be used (predefined codes)

36.2.2 Procedure of the Field observation

A field observation procedure follows these steps:

- Travel to the parcel subject of FO
- Check and collect missing information for CAPI according to the reason for FO
- collect the necessary data by one of the following options
 - ◆ Collect agriculture land cover
 - ◆ Collect landscape features information
 - ◆ Collect non agriculture land cover
 - ◆ Check for Critical defects

The main activity is to observe and report the true state of the land cover areas from selected field of observation points. During the assessment of land cover area a minimum of 2 pictures from different directions and angles (azimuth) should be collected from each FO. The pictures should be taken in a manner to give a clear image of the actual situation. The position from where to photographs are taken should be chosen to give a clear picture on the point investigated in its surroundings. Classification of land cover should be in accordance with the eligibility profile.

A List of the attributes that should be collected during the field observation:

- RP identifier
- Date of field visit (DD-MM-YYYY)
- Position of field observation point (format: North_X and East_Y coordinates with meter accuracy in the national SRS)
- Reason for field observation (example: unable to detect land cover during CAPI)
- Name of responsible (format: Name Surname)
- For each land cover inside RP collect type of agriculture land cover according to the eligible profile (Identified by attribute ?landcover? and value ?code?, see table 1)
- Taking photos for each land cover ? recommendation: 800x600 pixels, rgb 24bit jpeg image
 - ◆ Photo ID (naming: RP_ID_FO_1.jpg and RP_ID_FO_2.jpg)
 - ◆ Record azimuth and position (format example: 275°)
- Comments ? (example: The permanent crop identified is olive trees)

36.2.3 Data reporting

Data collected in the scope of the field observations is reported in a GML having similar structure as the one used for reporting Boundary inspection. The naming convention and the reporting of the photos collected on the field follows the same approach designed for the Boundary inspection as well. The table below shows how to report the FO data in that GML.

Element name	Description
<cap:fieldObservation fid="">	a unique identifier of the field observation point from which the photos were acquired
<cap:geometryProperty>	point-type geometry with an SRS and coordinates
<cap:rplID>	a unique identifier of a reference parcel observed
<cap:reasonForfieldObservation>	a reason for that particular Field observation, i.e. unable to detect land cover during CAPI
<cap:fieldObservationDate>	a date of the field observation
<cap:responsibleOperator>	an operator who conducted the observations
<cap:agricultureLandCoverClass>	an attribute recording the type of land cover or landscape feature (the user-defined legend code from Table 2 and the Land cover class type from Table 4 in Annex III, are used)
<cap:comments>	comments (free text providing some explanation on a given observation)
<cap:photoStorageLocation>	an URL of the photo location
<cap:photoDirectionAzimuth>	a direction azimuth in which the photo was acquired

Table 1. Elements present in the GML schema, used for Field observation.

36.2.4 Example of the field observation

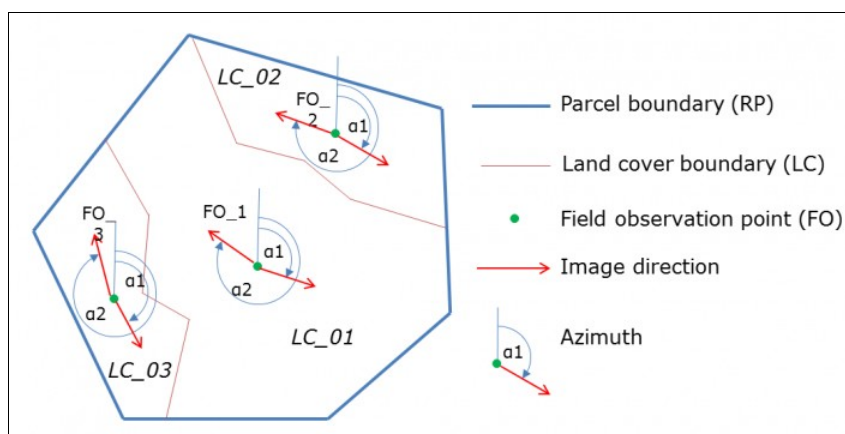


Figure explanation:

- Tick blue line ? reference parcel boundary collected thru the CAPI
- Thin brown line ? boundary of land cover area collected thru the CAPI
- Green dot ? field observation point position
- Red arrow ? direction of image acquisition
- Blue rounded arrow ? azimuth angle of image direction
- (LC_01, LC_02, LC_03) ? land cover areas
- (FO_1, FO_2, FO_3) ? field observation points

Note: the illustrated field observation produces only 6 photographs taken on 3 different positions. In this figure, all the lines (LUI perimeter and land cover subdivisions) were produced by CAPI prior to the FO.

Go forward to [Background](#).

Go backwards to [Table of contents](#).

37 Background 2012

[version 5.2](#)

[NEW ARTICLE](#)

The following articles provide the background on some pertinent methodological issues.

Please note that much more background information is available through the results of the

- ◇ [results of the Amsterdam LPIS workshop](#)
- ◇ [results of the Copenhagen LPIS workshop](#)

Go forward to [Sampling: practical considerations](#)

Go backwards to [Table of contents](#).

38 Sampling practical considerations 2012

version 5.2

38.1 Additional reading: some detailed considerations on the Sampling procedure

The following considerations are non-essential, but provide some broader context on the sampling plan selected for the LPIS QAF

38.1.1 acceptance sampling for inspection of discrete items in lots

ISO2859-2 is one of a series of sampling systems, schemes and plans presented in a number of Standards as ISO2859-x, ISO3951-x, ISO8422 and ISO8423. Each standard offers one or more sampling procedures and explains how these are to be used. The technical report ISO/TR 8550 guides towards an appropriate procedure for use in a particular situation

38.1.2 AQL vs LQ

ISO 2859-2 is indexed on LQ (limiting quality), Many acceptance sampling standards of the series use the more commonly known AQL (acceptance quality limit). The two concepts are different.

- ◊ AQL = quality level that is the worst tolerable process average when a continuing series of lots is submitted for acceptance
- ◊ LQ = when a lot is considered in isolation, a quality level which for the purposes of sampling inspection is limited to a low probability of acceptance

AQL provides a guide for the producer on the level or quality he needs to produce so that he can satisfy the acceptance criteria (sampling clause) most of the time for a given desired quality. He must aim to produce better than the AQL. By contrast, the LQ does not provide a reliable guide for the consumer as to the true quality of the accepted lots. Acceptance only indicates the quality of the accepted lot is better than the LQ, it does not say how much better. The limiting quality should be chosen realistically at a minimum of three times the desired quality (often expressed as AQL).

38.1.3 Producer's risk vs Consumer's risk

The verdict on a lot can be false in either of two ways.

- ◊ Occasionally a 'good' lot may not be accepted because the sample inspected, though randomly selected, does not reflect the true quality of the lot. The risk of this happening is known as 'producer's risk' (PR). (type I error / ? error / false positive).
- ◊ Conversely, a 'poor quality' lot may pass inspection because of the limited data available in the sample. This eventuality is known as 'consumer's risk' (type II error / ? error / false negative).

The MS require a high probability of acceptance if the quality is good while the Commission would want a low probability of acceptance if the quality is poor. Conventionally these probabilities have been set at 0,95 and 0,10, respectively. This gives a PR of non-acceptance of 0.05 or 5%, and a CR of accepting poor quality of 0,10 or 10%.

These probabilities represent the risk of false decisions for an LPIS that balances around the desired quality. Much 'better' LPIS lots obviously have a much smaller chance to be rejected, 'poorer' lots have a smaller chance to be accepted.

38.1.4 Procedure A vs Procedure B

ISO 2859-2 offers two distinct procedures: Procedure A, to be used when both supplier and consumer regard the lot in isolation and Procedure B, when the supplier regards the lot as just one of a continuing series and wishes to maintain consistent procedures for all customers

- ◊ the tables for procedure A (lot in isolation) are based on random sampling from finite lots for both consumer's and producer's risk.
- ◊ for procedure B, tables are based on
 - random sampling from a finite lot for the consumer's risk at the LQ,
 - random sampling from a process for the producer's risk and the tabulated values of the operating characteristic curves.

Applying Procedure B could eventually be considered when a MS considers it continuously captures all updated parcels during its daily operations and is running a formal quality reporting to other LPIS users than the Commission.

38.1.5 Acceptance ? Rejection

In the LPIS QAF, of course, the test result is not mechanically applied i.e. failure to meet a requirement doesn't involve the literal 'rejection' and re-submittal of the LPIS or trigger a financial correction. When a LPIS is found not to meet the desired quality, the MS is invited to further investigate the found issues and report on it.

Go forward to [Orthoimagery](#).

Go backwards to [Table of contents](#).

39 Sampling practical consideration 2012

version 5.2

39.1 Additional reading: some detailed considerations on the Sampling procedure

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- ◇ the tables for procedure A (lot in isolation) are based on random sampling from finite lots for both consumer's and producer's risk.
- ◇ for procedure B, tables are based on
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Go forward to [Orthoimagery](#).

Go backwards to [Table of contents](#).

40 Orthoimagery 2012

version 5.2

40.1 General

The quality of the VHR orthoimagery, provided in the frame of the CwRS, is very much dependent on the ortho-production process. Contrary to the production of aerial orthoimagery, where the process can be assumed straightforward and the producer is in control of the relevant internal and external conditions, the quality of the satellite orthoimagery is very much dependent of ancillary data (GCPs, DEM) over which the producer often is not having direct control. Thus, in order to analyse whether a particular sensor or acquisition conditions are not appropriate for the ETS, we first need to evaluate, if the derived orthoimage used in the ETS is of optimal quality. The image content can be seriously downgraded, if an inappropriate orthoproduction process or irrelevant ancillary data are used. It has been observed, that often the orthoimage producers pays usually little attention to radiometric quality, colour balance and the preservation of the image detail, at the expense of thorough check of geometric quality. An explanation of the phenomenon could be the fact that there are no clear and standardized metric developed worldwide in respect to the quality check of the radiometry.

In this respect, JRC revised its Guidelines for Best Practice and Quality Checking of Ortho Imagery and the Orthoimage technical specifications for the purpose of LPIS [Orthoguidelines](#). These guidelines and specifications can be revised in the light of the findings from the ongoing ?screening? of the ETS results, and specific, more stringent, requirements can be proposed for the orthoimagery used in the LPIS QA. In that respect, JRC is planning to perform an evaluation of the orthoimagery used in the ETS 2010 and 2011 whether it meets the current orthoimage specification.

The following discussion points aim to clarify some questions raised by the MS Administration on the impact of the orthoimage quality and operator subjectivity on the ETS performed in 2010.

40.2 Poor relative coordinate accuracy of the orthoimage could affect the ETS

A list of possible metrics to assess the relative accuracy, as residual plots or visual inspection of the planimetric fit between the vector and raster data, are given in the Guidelines for Best Practice and Quality Checking of Ortho Imagery. See also Annex II (point II.3).

40.3 Satellite image quality is not always sufficient to distinguish certain types of and cover features (for example bracken vs. rush)

ETS maps and classifies the land cover features, based on their structural-physiognomic aspect. For example, distinction of the bracken from rush can be very difficult (even sometimes impossible) from one single image snapshot, even if 25cm aerial orthophoto is used, as both are herbaceous plants and share the same structural-physiognomic properties (plants belonging to the rush family (Juncaceae), may superficially resemble grasses). Differences might come evident, if we consider as well the floristic aspect, but in this case we might need multi-temporal image data in order to trace the specific phenological development of each of the plant under investigation. The specific location can be another factor which might give us indication on the correct type of plant. However, the most important question is whether we need this distinction, as both are invasive plants which are considered not part of the agriculture land cover ?envelope?.

40.4 The uncertainty in image photo-interpretation due to the operator subjectivity has to be accounted in the ETS results

Subjectivity is inevitable when the interpretation is done by human ? but it is the best approach we still have. In any case, the human-inherited cognitive reasoning is superior to any machine-learning method of interpretation and classification. The uncertainty in interpretation could be reduced by acquiring knowledge on the subject (trained operators) and by following strictly the inspection procedures. Also the uncertainty of the feature or border identification is not an inherent problem of remote sensing detection only, but also of the measurement process on the field.

40.5 Inappropriate elevation angle cause poor orthorectification

The question whether the elevation angle is inappropriate or not, often depends on the specific application of the imagery collected. In any case, image data acquired with lower elevation angle is more demanding in respect to the scope and quality of the ancillary data, used for the production of the orthoimagery. But this doesn't prevent images acquired with lower elevation, to be orthorectified with the desired quality, once the adequate ancillary data and orthorectification methods are used.

40.6 Occlusion of tree and buildings and shadows effect cause ambiguity in the CAPI

Occlusions caused by land features with certain height and shape are generally common issues in the use of remote sensing. Although the obstruction of certain part of the land cause by leaning artificial structure could be resolved at certain extend using true orthos, the obstruction caused by the tree canopies could be eventually prevented (always partly) only if the image is acquired in a particular period of the year, where the leaves are not present (an ortho-acquisition strategy commonly used for cadastral projects). The problem of occlusion and its impact on the CAPI ambiguity was already identified during the ETS feasibility study done in 2010 [1], where it was found that most of the cases of occlusion can be attributed to the fact that the VHR imagery was acquired with low elevation angles.

However, the image oblique view (caused by acquisition with lower elevation angle), taken as isolated factor, cannot be responsible alone for the observed ambiguity of the CAPI. In many cases, even when certain portion of the land is not visible due to obstruction from ?leaning? features, there

might be still enough information content on the image, which could allow the operator to make correct interpretation. The problem is related to the fact that the elevation angle primary determines the Field of View (FOV) of the sensor scanner (FOV - The area or solid angle which can be viewed through an optical instrument), and in particular the Instantaneous Field Of View (IFOV) , which is an altitude dependent measure of the ground resolution of the scanner. In summary, it means the ground sampling distance (GSD) of an image, increases with the decrease of the elevation angle of acquisition. Larger GSD means lower spatial resolution, which by default cannot be compensated by resampling of the original image, to an image with smaller pixel size, than the GSD.

Thus, the combination between the oblique viewing and the decreased spatial resolution is reason for the observed deterioration of the image information content to a level when it is not sufficient for the CAPI operator to draw a conclusion. The magnitude of this degradation highly depends by the type of sensor and its flying altitude. Obviously images collected by sensors, acquiring at higher spatial resolution (GE-1, WV-2) will be less prone to the impact of the lower elevation angle than the images collected by sensors, acquiring at lower spatial resolution (IKONOS). This was observed also during the feasibility trials, which further lead to the elaboration of some recommendations in respect to the elevation angle and the type of sensors, found suitable for the LPIS QA.

40.7 Time of the acquisition is an important factor in the ETS decision process

As written in point 4.1.5. of Annex III, temporal variations influence the appearance of the land cover but should not influence its nature or description, because that particular type of land inventory is independent of the time of observation. For that reason the ETS operator should not solely rely on brightness or colour appearance when interpreting the given land cover, but also has to take into account the full range of abundant information the imagery at that spatial resolution is able to provide on shape, texture, location, and spatial context (see Annex II).

40.8 Phenological development is an important factor in the ETS

True indeed, but as far the ETS is based on classifying the land cover from the point of view of its structural-physiognomic, and not floristic, aspect, it should not be too sensitive to the variation in the phenological development of the vegetation. Of course, as said above, it can have an impact on the rate of occlusions of land features from tree canopies.

40.9 Can multi-temporal CwRS data bring significant added-value in support to the ETS decision process?

Multiple acquisitions of VHR data is highly unfeasible with respect, and might be done in the frame of the CwRS programme, only if size and number of CwRS zone is reduced significantly. The use of CwRS HR multi-temporal (for example Rapideye) data can be an alternative, but needs to be further investigated. See RapidEye project results (Bergamo proceedings).

Go forward to [Quality element thresholds](#)

Go backwards to [Table of contents](#).

41 Quality element thresholds 2012

version 5.2

NEW ARTICLE

EXPECTATIONS

- QE1 (total area):

2%: threshold for serious error in the [Court of Auditors DAS methodology - update](#): the document has been updated and defines this as "materiality threshold"

- QE2 (rate of area based non conforming parcels):

3%: this threshold difference is twice specified in the Comm Reg 2009R1122: Both cases relate to a comparison between an area observed and an area declared.

◊ in Article 58: Reductions and exclusions in cases of over-declaration: *the area declared for the purposes of any area-related aid schemes, ..., exceeds the area determined ...if that difference is more than either 3 %...*

◊ in Article 55: Non-declaration of all areas: *the difference between the overall area declared in the single application ... and the area declared plus the overall area of the parcels not declared, ..., is more than 3 % of the area declared.*

In a good LPIS Area declared should be derived from the LPIS reference area.

5 % and 7% thresholds include a degree of technical tolerance for smaller parcels as add on to 3%

1ha: maximum tolerance of [OTSC methodology](#)

- QE3 (causes of non-conformities and defects) and QE5 (area declaration rate):

5%: Arbitrary: serves an indicator/alert function.

- QE4 (rate of defects)

LQ2: a LPIS should have no true critical defects at all. The limiting quality (in percent nonconforming parcels) is set to 2 as in the threshold for serious error in the [Court of Auditors DAS methodology - update](#): the document has been updated and defines this as "materiality threshold"

- QE6 (accumulated change rate):

25%: Arbitrary: serves an indicator function.

- QE7 (rate of irregular applications):

◊ 2%: threshold for serious error in the [Court of Auditors DAS methodology - update](#): the document has been updated and defines this as "materiality threshold"

◊ not significantly higher than previous year: based on good quality management principles

LQ INDEXES

- Regarding the verbal expression of the expectation" into Limiting Quality indices (used to determine the acceptance number for attribute sampling):

Lot size		Limiting quality in percent (LQ)		
		2,0	8,0	12,5
35 001 to 150 000	n	500	315	200
	Ac	5	18	18
150 001 to 500 000	n	800	315	200
	Ac	10	18	18
> 500 000	n	1 250	315	200
	Ac	18	18	18



◊ QE4 - for 1% / LQ2 : please look at slides 13-14 of [this presentation](#)

◊ QE2 - QE3 - QE5 for 5% / LQ8 : The Commission services suggests to move from LQ8 to LQ12.5. Although this LQ substitution mimics a bit the choice recommended in 3.5.1 of ISO2859-2 on AQL/LQ ratio, we must nevertheless stress that the 5% expectation was not expressed as an AQL value from start.

The resulting acceptance numbers are indicated on the right.

- QE1 and QE7 both measure a variable value but do not count non-conforming items. This allows [direct application of the expectation error rates](#). There is no expression of LQ applicable.

Go forward to [ISO19157 and ETSv5.2](#)

Go backwards to [Table of contents](#).

42 ISO 19157 and ETS v5.2 2012

version 5.2

NEW ARTICLE

42.1 Conversion of measurement tables

The ISO 19157 standard cancels and replaces the ISO 19113:2002, ISO 19114:2003 and ISO/TS 19138:2006 standards. Reviewers of the LPIS QA Framework recommended the new standard for describing data quality measures as ETS v5.1 was formatted on ISO/TS 19138. This document describes how the LPIS data quality measures of ETS version 5.1 were mapped to version 5.2 using the common set of data quality components. For easy referencing a separate mapping table is provided for each ETS v5.1 table.

ISO 19157 introduces the concept of **component** to describe the various aspect of the test. During the conversion, data quality components "Data quality unit", "Specification", "Aggregation method" and "Derivation method" were added to the tables.

1. **Data quality unit** is the unique combination of a scope and a data quality element (Figure 1).
2. The **Specification** component was introduced for all data quality measures where conformance is evaluated, in order to provide reference to the relevant product specifications or user defined requirements.
3. The **Aggregation method** and/or **Derivation method** components were introduced to clarify the evaluation process based on existing results.

Please note that the component "Evaluation procedure" was introduced to provide reference to the description of the detailed procedure in Annex II (summarized in DQ_evaluationMethodDescription).

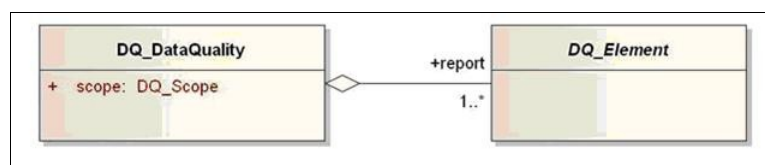


Figure 1: ISO 19138 elements that form a ISO 19157 data quality unit

Table 1 represents the generic correspondence between ETS v5.1 entries and ETS v5.2 components. The column "Possible numeration" indicates the corresponding number(s) within the individual tables. The number depends on the action undertaken for a given data quality unit.

ISO 19138 (ETS v 5.1)	ISO 19157 (ETS v 5.2)	Possible numeration
DQ_Name	Name	3.2
DQ_Alias	Alias	3.3
DQ_Scope	Data Quality Scope	2
DQ_Element	Element name	3.4
DQ_Subelement	Element name	3.4
DQ_Measure	Basic Measure	3.5
DQ_MeasureDef	Definition	3.6
DQ_MeasureDesc	Description	3.7
DQ_MeasureRefSource	Source Reference	3.10
DQ_MeasureID	Measure identifier	3.1
DQ_EvalMethod	Evaluation method type	4.2, 4.3
DQ_EvalMethodType	Evaluation method type / code	4.3, 4.4
DQ_EvalMethodDesc	Description / Evaluation method description	3.7, 4.4, 4.5
DQ_QualityResult	Data quality result (DQ_ConformanceResult) / Value / Pass	5, 5.1, 5.3
DQ_ValueType	Value Type	3.8
DQ_ValueStructure	Value Structure	3.9
DQ_Value (example)	Example	3.11
DQ_ValueUnit	Value unit / Pass	5.2, 5.3
DQ_Date	Date	4.1, 4.2
DQ_ConformanceLevel	Conformance level	4.6, 4.7
Example dataset parameters	Example	3.11
Example quality result meaning	Explanation	5.2, 5.3

Table 1: Generic conversion table from ISO 19138 to ISO 19157 components

The conversion path of the individual tables is presented in a [separate document](#).

42.1.1 Categorization of tables by data quality result and workflow position

The resulting tables can be categorized by the level of aggregation, derivation and conformity assessment included in their components. All measures involve some kind of observation (measurement), those with components of aggregation and derivation depend on data from other tables, a conformity component indicates that data quality evaluation is involved.

As a result, based on the presence of the newly implemented components, the following six categories can be identified.

	Makes raw observation	Uses input from 1 other table	Uses Input from >1 table	Performs conformity evaluation
Measurement	V			
Measurement followed by evaluation on those observations	V			V
Derived observations	optional	V		
Derived observations followed by evaluation	optional	V		V
Derived and aggregated observations			V	
Derived and aggregated observations followed by evaluation			V	V

Table 2: meaning of the categorization of measures

Such categorization set out against the phase in the workflow leads to the following table.

Resulting type	Feasibility for inspection and measurement	Inspection and analysis at RP level (The quality scope refers to the features of the inspected RP)	Data consolidation and analysis at LPIS sample level (The quality scope refers to the LPIS QA sample)
1. Measurement	10100, 10101	10102	
2. Measurement followed by evaluation		10106	
3. Derived observations		10103, 10104, 10104_2, 10105, 10102_1	
4. Derived observations followed by evaluation		10102_3	10204, 10205, 10207
5. Derived and aggregated observations		10107	10203, 10206
6. Derived and aggregated observations followed by evaluation		10102_2	10201, 10202, 10202_2, 10208

Table 3: LPIS QA measures by category

Go forward to [Frequently Asked Questions](#) .

Go backwards to [Table of contents](#).

43 FAQ 2012

version 5.2

Frequently Asked Questions (QAF-FAQ)

43.1 1. What are the implications on the workload of the introduction of the 'four-eye control'?

The Ex-post verification of the ETS inspection ("four-eye control") serves to confirm the correctness and reliability of the observations made during the ETS. It is similar to procedures incorporated by many MS in their LPIS update processes and it is not expected to cause a significant increase of the ETS workload, if set up appropriately.

- limited to a verification of 3 components/outcomes of the ETS
 1. feasibility for inspection
 2. feasibility for measurement
 3. overall quality of the land cover inventory
- comprised of a visual confirmation only (no data collection or spatial analysis is required)
- aimed to detect obvious 'gross' errors (no need to check minor details)
- performed in batches alongside the ETS inspection process on sets of already inspected RPs (thus efficient).

By contrast, as does any quality control activity, it could identify certain doubtful points and bottlenecks in the ETS inspection, which, once clarified in due time, could even lead to an increase the overall inspection process performance.

43.2 2. Real world examples should be added in the JRC guidelines to prevent different interpretations of a situation.

Please suggest and provide examples (even anonymous) where different interpretations (could) occur. We already allocated a specific [WikiCAP article](#) where one can upload specific cases and examples, which we could jointly comment.

NOTE: Real world example do complement and enrich the 'theoretical' instructions, but cannot provide a full visual interpretation in a way the schematic illustrations do. Indeed, examples can be either too specific or just not specific enough. The illustrations provided in WikiCAP are generic schematic graphical representations of the instructions and can be then interpreted and applied by the MS in their particular context.

43.3 3. Clarify the measurability of the LUI.

What are the (exact) criteria for measurability?

No stricter rules can be drawn as the LUI interpretation case-dependent. See also question [67 from 2011](#).

When is it a LUI issue (non-measurable) and when is it a minor error where we just reduce/adjust the RP?

A "LUI issue" happens when the CAPI method cannot be applied (e.g. because the crop happens to the same on each side of the RP boundary. Else the operator's actions must follow what he observes (this is not exactly "adjusting the RP"), using his knowledge of the specification, his expertise and applying common sense.

Note: in ETS, the notion of error is linked to a particular cause of an observed non-conformity. The concept "minor error" is not defined.

43.4 4. What data should be collected for the non-structured evidence upload?

This instruction applies to data or information that is additionally consulted and considered by the ETS inspector relevant for the interpretation of a particular reference parcel. Since it is assumed that most of the RPs can be inspected on the base of the reference data only, it is obvious that such evidence is not required systematically for all inspected parcel, but only to those where data 'external' from the ETS was gathered and available to bring further clarification of the observations. The unstructured evidence is required, but should be strictly minimal (1 page scan or print).

Does it mean that we shall collect screen dumps for each reference parcel and merge it all into a PDF?

No and no; It is only collected for parcels where it adds "extra-ordinary" information and screen dumps may or may not be appropriate.

43.5 5. Why is an LUI considered "unclear", even when the ineligible feature is not within 5m of the unclear part of the RP perimeter?

For topographical or physical block systems in particular

The 5-meter buffer rule is applied over the entire perimeter of the LUI as it addresses the ambiguity in the absolute positional accuracy of both the orthomage used for the LPIS QA and the LPIS, which results in inherent misalignment between them. Please consult [5-meter buffer 2012](#).

One cannot make an independent area measurement by digitising a polygon that has some unclear boundaries.

Note: if that portion of the boundary, even masked by the present land use, can be observed within its spatial context (e.g. the beginning and end of a straight line are identifiable), that portion should be mapped.

43.6 6. The current definition of the critical defect "Multi-parcel" is problematic.

Esp. for certain LPIS designs and some typical agriculture landscapes

The term "parcel" relates to "a tract or plot of land", implying some notion of singularity. What precisely is considered a "plot of land" is defined by the nominal LPIS design (cadastral parcel; physical block;....).

Multi-parcels are conditions where several (> 10) such plots are amalgamated into one formal reference parcel. These amalgamates increase operational risks and reduce performance (see slides 23-34 of [this Amsterdam WS presentation](#). There is no hard argument to support an ETS modification on this defect now.

In ETS v5.2 QE scores and their assessment in the particular LPIS context are integrated, offering the administration a means to clarify how their operations deal knowingly with the observed multi-parcel issue.

43.7 7. QE7 is not representative with the current measure.

Should there be a link between the OTSC and LPIS QA samples for QE7?

Noted. A revision of this quality element is probably not needed but an alignment between the OTSC random sample and the LPIS QA sample should be prepared from 2013 onwards.

The purpose is to achieve a common random sample OTSC/LPISQA large enough to draw valid conclusions on the effect of LPIS on irregular aid applications.

Since the OTSC sample is produced by the Paying Agency and the LPIS QA sample pre-selection by the JRC, alignment of both procedures will be necessary.

JRC will propose such alignment on the Paphos conference and update the [art 34] and [art 6] guidance where necessary.

43.8 8. Please provide further clarifications on the concept and use of pro-rata.

The concept of "Pro-Rata" refers to a method of handling particular land covers (bio-physical phenomena) that represent an intrinsic mix of different life forms (different vegetation types from physiognomic-structural viewpoint) that co-exist on a particular area of the Earth surface and that are completely inter-dependent. A typical example of such intrinsic mix could be natural grassland and shrub, where one of the life forms is herbaceous vegetation. If accessible for grazing, this component has an agriculture potential that makes it agriculture land. However, the intrinsic mix makes a straightforward quantification of the agriculture (eligible) land through delineation of the herbaceous vegetation alone impossible. But, if one can demonstrate that the proportion of grass area within the mix is relatively stable, the variation in the ratio between different patches can be presumed insignificant for the particular mix.

Therefore, if one could estimate and establish in advance, through scientifically-sound methods, an average ratio for the intrinsic mix with sufficient degree of confidence, this can quantify the agriculture land available for the area covered by that intrinsic mix, by delineating the whole area as single polygon and multiply the polygon area by the (grass) ratio expressed as percentage (or alternatively, the reduction coefficient for all non agricultural area inside the mix).

For this approach to function, each particular intrinsic mix will have its own defining characteristics and specific ratio. It should be listed as separate land cover class in the eligibility profile with a proper LCC definition and UDLC. The specific ratio should be given in the "Eligibility Hectare Factor" field.

IMPORTANT NOTE: This concept of pro-rata is applied at the level of the particular land cover type. It is implemented at the level of the reference parcel MEA directly from mapping (GPS/CAPI area delineation of the land cover). Reduction of the MEA applied on parcel level by other methods such as "scorecards", documented subtraction of area are not considered pro-rata.

43.9 9. How do we deal with radiometry within [orthoimagery specifications](#)?

The measures for the radiometry data quality sub-elements of [orthoimagery technical specifications for the purpose of LPIS](#) are still under development and testing. For immediate guidance, we have compiled a [dedicated article](#) with thoughts and experiences on these sub-elements.

43.10 10. Do we report only inspected and skipped parcels in the Lpis Sample Pre-selection Status XML?

NO. The file LpisSamplePreselectionStatus.xml should contain all RP provided by the Lpis Sample Pre-selection file in a reporting year:

- the inspected parcels should hold all RP_FSI values as ?false? and belongsToQC_Sample as ?true?;
- the skipped parcels should present valid reason for skipping, skipped occurrence="true?" and belongsToQC_Sample as ?true?;
- the other RP (neither inspected nor skipped) should hold all RP_FSI values as ?false? and belongsToQC_Sample as ?false?.

As a consequence:

- the number of inspected parcels (not including the skipped ones) should be equal to the sample size for the ETS inspection.
- the number of parcels flagged as: belongsToQC_Sample = ?true? should reflect the sum of the inspected and skipped parcels.

43.11 11. In the assesment report template, what is the difference between assessment and evaluation?

The difference was introduced for to reasons:

1. to allow for a better distinction between the output of the conclusion and conclusion
2. to include considerations previous assessments into these conclusions.

As a result, what is expected is:

- **Assessment:** a summery description of the findings (i.e. the scores, meeting thresholds?? other relevant observations)
- **Effect of actions:** the observed changes from last year esp. regarding possible effects of an action from the 2011 remedial action plan, if any.
- **Self-evaluation:** taking into account both above and possibly other analysis, provide your final conclusion and what needs to be done and why (i.e. define a remedial action,, continue or take no action,...)

For further reading see e.g. <http://www.differencebetween.net/miscellaneous/difference-between-assessment-and-evaluation> (from quick googling).

Go forward to [Discussion pages \(shared experiences\)](#) to see the details.

Go backwards to [Table of contents](#).

44 Discussion pages 2012

[version 5.2](#)

Discussion pages (shared experiences)

This space is for You. We have not set up a formal forum, with moderator and specific software but trust that this Mediawiki environment allows you to place your comments on these pages.

Go forward to [Member State feedback and Q&A](#)

Go backwards to [Table of contents](#).

A "LUI issue" happens when the CAPI method cannot be applied (e.g. because **the crop happens to the same on each side of the RP boundary**. what does *the crop happens to the same* mean?

45 Member State Q&A 2012

version 5.2

The following tables list the feedback, suggestions and comments from the Member States on ETSv5.2 since the publication of the draft in March 2012.,

- The "Q" field identifies the comment sequentially, irrespective of the issue/reference.

@2012-08-14 the count stands at 41.

@2012-08-20 4 added --> 45

@2012-09-20 2 added --> 47

45.1 General

Q	MS	Issue / reference	MS question / remark	JRC Reply
4	DK	WikiCAP pages	All (or most) of the previous clarifications and Member State feedback and Q&A should be incorporated in the 2012 guidelines.	To be considered, however it requires a complete overhaul of the documentation and risks exploding the volume of the 2012 guidance. Furthermore, some of the previous Q&A are related to previous ETS versions, and are obsolete to the current version.
14	NL	General	Do not make the ETS more complex and detailed as it is now.	Noted, please also note the opposite suggestion above.
21	ES	General	There is no justifiable reason in ETS why RPs based on cadastre should be considered as not suitable for measurement in those cases when the LUI is not identifiable on the image.	ETS doesn't use the terms "not suitable for measurements", but the term "non-measurable" which is strictly applied and valid within the CAPI context. A RP LUI that doesn't follow well identifiable limits of land cover and/or land use on the orthoimage, and thus is flagged as non-measurable with CAPI, can however be fully measurable in the ground. This is perfectly valid also for cadastral parcels boundaries. Note that this "non-measurable" flagging does not mean the parcel has a problem, only that during inspection, no independent measurement could be made by CAPI.
22	ES	General	If the limit of the cadastral parcels is not considered a valid boundary of the RP, there will be a high percentage of ?not suitable for measurement? reference parcels. As a consequence, we would have a smaller sample and the probability of LPIS being considered of failing quality would increase.	The introduction of the field inspection and optional field activities in the ETS v5.2, as well as the last modification before the ETS freezing (Version 5.2 @ 2012-06-30) should effectively address such situation, ensuring valid sample sizes by ISO2859-2 for all QE.
23	ES	General	LPIS QAF needs to be adapted to include LPIS based on Cadastre.	We believe by ETS v5.2 the LPIS QA methodology is fully adapted to accommodate the cadastral parcel.
24	ES	General	Why field observations for skipped parcels? Please clarify.	See Scope and purpose of the field data collection . In line with the comments above, the field inspection is activated to ensure a sufficient sample of random, independently measured parcels (a.k.a. DirectExternal inspections).
29	DK	General	Combination of GPS and CAPI. At the workshop we discussed the issue with the combination of GPS and CAPI. As an answer to a question you mentioned that JRC might be open to this combination in Member States, who are using high resolution orthophotos. In Denmark we are purchasing orthophotos with a pixel size of 20 cm or better, and a ground point accuracy of 40 cm or better. Could you, please, verify that Member States with this type of orthophoto may use a combination of GPS and CAPI.	Combining two types of data capture requires an appropriate absolute positional accuracy (APA) for each type. For orthoimagery, the APA is well expressed as RMSE/CE90, but the issue is tricky with the survey or vector data where the APA assessment for lines/boundaries vectors is not so straightforward. The first ETS contained such a test, but it was found impractical. From a methodological perspective, this APA challenge is related to the one of the "boundary delineation margin" proposed by the NL. Studies on this are being discussed.
30	MT	General	Member States who are lacking GNSS infrastructure/equipment, presently have no tool to vindicate parcel boundary critical defect ?invalid rp boundary or not measurable by CAPI?. Can JRC suggest any alternative to such method? Are the concerned MS obliged to setup such infrastructure to comply for QE3 of ETS? Does article 6(d)of 1122/2009 makes the use of such technologies obligatory? Answer from JRC or the Commission is welcome in order to build a business case in the event such infrastructure, equipment procurement and training services are needed for such a setup.	When a MS doesn't have a CORS/POS network installed, it might consider investigating augmentation services such as Ominstar or Starfix who claim to achieve horizontal accuracies of +/- 15 cms. JRC has not done any tests with either.
32	BE-WA	General	Could we use only part of the VHR ortho for the sampling?	No, such strategy is not appropriate. The clipping of the point zero state GML should be done with the full extent of the LPIS control zones. The guidance foresees the discarding of imagery that does not comply with our recommendations after that pre-selection phase, on condition that this does not affect the randomness of the remainder of the sample. Partly for this reason, the sample-preselection is made three times the prescribed sample.
33	BE-WA	General	Tutorial in WikiCAP on XML-parsing	A general tutorial as part of the LPIS QA guidance cannot be produced by the JRC with its current resources.
34	CZ	General	We need a manual for photo interpretation	JRC cannot provide a general, pan-European manual for photo interpretation since it lacks the site-specific knowledge required for all possible agricultural land cover types. We will however

				provide basic rules applied on some examples of "typical" agricultural lands.
35	LV	General	How to treat multi-parcels - not always clear	Any detected multi-parcel (i.e. >10 components) should be split up into all its composing parcels. Use due judgment to treat "near multi-parcels" i.e. reference parcels that contain less than 10 singular parcels and are therefore not labeled a critical defect. Remember that singular parcels are performing better (i.e. simpler location and administration) than the amalgamate and are much less risky for your system.,.
36	UK-WA	General	We have successful acquisitions within the LPIS QA specifications for CwRS zones that we not initially part of the LPIS QA zones. Our sample pre-selection is already generated. Could we add these zones in the LPIS QA and redo the sample pre-selection process?	Yes. In any case, according to the guidance, all non-LPIS risk CwRS zones should have been entries of the ApplicableCIDzones. It is easy to discard a poor quality acquisition from the LPISQA zones (only remove it from OthoimagerySet), but adding zones requires redoing the sampling.
39	RO	General	Could we use VHR data acquired with elevation angle lower than the recommended threshold in wikiCAP, if we consider that they are more qualitative than other images with elevation angle within the recommended range?.	The range for the elevation angle of VHR acquisition given in "Control zone and imagery selection 2012" page of WikiCAP can be considered more as recommendation, rather than strict specification. On flat terrain with large, unfenced/unobstructed fields, indeed the elevation angle might cause no adverse effects and be fully suitable for LPIS QA. So, you can use such imagery if the usability of the product is justified. Please also note, that the prime objective of the initial acceptance of the orthoimage prior to the ETS (Annex II, Section 1) is to check the output of the ortho-production process, and not the quality of the raw/input image data.
40	RO	General	How to proceed with "oblique" VHR imagery acquired over hilly-mountain areas, as in many cases the quality of the produced orthoimage is not sufficient for the ETS?	For the hilly regions, there is no option to exclude 'ex ante' non-nadir imagery because of the topography alone (which is indeed also affecting the RP creation). What JRC considers appropriate is, 1/ use an objective topography parameter to decide on the minimum elevation angle for each and every zone. 2/ analyse the hilly and flat areas separately 'ex post' in your assessment report.
41	RO	General	What are the general rules for skipping/accepting control zones (or part of them) for LPIS QA?	Note: we use the concept of ?skipping? during the parcel inspection loop and ?discarding? during LPISQA zone selection It is not possible to discard zones without a clearly demonstrated LPIS risk (before sample-preselection) or failed acquisition (after sample preselection). The LPIS under all zones is made by one set of rules so inclusion of as many zones as possible is needed for better representativeness. The criteria for discarding zones must objective, relevant and systematic and it should not result in a bias or manipulation of the LPIS QA results. Excluding areas simply because they are more challenging is NOT valid as this would result in testing the given LPIS in optimal conditions only.
42	CZ	General	It would be nice to have an automated tool for quick identification of RPs at risks	We consider this is an import element in the (non LPIS QA) monitoring and upkeep processes of your LPIS. Some ideas can be found in previous presentations of the Workshop and Conference. Please share other relevant links. The main JRC papers that explored various automated or semi-automated approaches contributing to the identification of LPIS RPs at risk are: <ul style="list-style-type: none"> • Detecting artificial areas inside reference parcels. A technique to assist the evaluation of non-eligibility in agriculture • (Google Chrome only!) Contrast Analysis in Very High-Resolution Imagery for Near and Far Neighbourhoods • Spectral Difference in the Image Domain for Large Neighbourhoods, a GEOBIA Pre-Processing Step for High Resolution Imagery • A hybrid method combining SOM-based clustering and object-based analysis for identifying land in good agricultural condition • Assessment of the Application of Rapideye Imagery for the Inventory and Monitoring of ?Eligible? Land under SAPS in Bulgaria

45.1.1 Annex I

Q	MS	Issue / reference	MS question / remark	JRC Reply
7	DE	Annex I	Annex I tables 0 to 17: what is the meaning of "001directInternal", "002directExternal" and "003 indirect" in the field 4.3 evaluation method type?	From C.3.2 DQ_EvaluationMethodTypeCode of ISO 19157:

			What is the difference between these types?	<ul style="list-style-type: none"> • directInternal - method of evaluating the quality of a dataset based on inspection of items within the dataset, where all data required is internal to the dataset being evaluated • directExternal - method of evaluating the quality of a dataset based on inspection of items within the dataset, where reference data external to the dataset being evaluated is required • indirect - method of evaluating the quality of a dataset based on external knowledge
9	DK	Annex I	Interpretation of Table 2 (eligible area) and Table 6 (contamination: counting features) of Annex I. Both Table 2 and Table 6 deal with a 3%-rule, but there are two different 3%-rules. Please provide further clarifications	The rule is different as it relates to different quality measures. There is a higher resolution required for the accuracy of the area accounting (Table 2) than on the feature abundance reporting (Table 6). The difference calls for the ETS operator to always take into account any small exclusions if they jointly account in total for at least 3% of the RP area, but to report the presence of a particular non-agriculture land cover feature type only if the feature (or features) of that individual type exceeds in total 3% of the RP area.
10	DK	Annex I	In the 3%-rules from table 2 and table 6 landscape features smaller than 0,01 ha must also be taken into account. But it does not include landscapes features like trees (less than 50 trees/ha), bushes and rocks, IF these features in general are considered as eligible according to national rules.	As the landscape features are MS-specific, the inventory (mapping and area estimation) of the landscape features is done in accordance with the mapping instructions and specifications, defined by the EU Member State Administration in their Eligibility Profile. There cannot be common mapping rules for the national landscape features in the ETS. That is clearly explained in points VI.3.iii and VI.4.ii of Annex II (describing the full instruction of the ETS procedure).
11	DK	Annex I	We would like to have further explanation and illustration of incompatible LPIS design?	Noted. If a system does not allow to identify whether failures are due to any of the predefined management processes, it is not designed properly. The class substitutes the traditional "other reasons" below the cascade, as "other reasons" does not offer remedies. As an example, imagine a reference parcel designed based on geographical grids, each RP measuring 1 kmsq; it would fail the ETS tests but this failure cannot be allocated to lack of update, missed upgrades, poor or incomplete processing. In fact, these processes were not duly considered or traceable in the design of such grid, hence the need to address the "incompatible design".
12	DK	Annex I	The field observation should only limited to collect evidence for the unclear part of the CAPI.	This is the case in the ETS v5.2. Note: this FO is not to be confused with a combined CAPI and field inspection where a methodology is currently lacking.
13	DK	Annex I	All kinds of ancillary data are allowed except for rapid field visits. Why?	This interpretation is not correct. Use of any relevant data is foreseen for the field inspection (former Rapid field Visits). See also Field observations 2012
20	ES	Annex I	The current design of the QE7 is not representative. Needs revision.	Noted. A revision of this quality element will be considered in the next version of the ETS.
16	IE	Annex I	The guidance for digitizing of features less than 0.1 ha needs to be changed. There should be separate layers where all feature has to be delineated (even those that are not reported).	See Release notes of LPIS QA 2012 (Version 5.2 @ 2012-06-30) and consult also Measurement, estimation and counting 2012 .
17	SI	Annex I	Are the linear features of 2 meters, part of the 0.10 ha rule?	It applies for non-agricultural features, see point VI.3.iii of Annex II. Note that art 34(2) linear features of less than 2m width can be incorporated in the agricultural land they border or mapped on their own right. Art 34(3) linear features are always mapped on their own right.
28	DE	Annex I	Table 12: at the end of No. 4.5 is a note on how to handle RPs having recorded area set to zero. For which kind of parcels is this note foreseen? There are RPs with recorded areas set to zero in the case of VI.2.i (boundaries cannot be identified by visual inspection and there are ineligible elements in the 5m-buffer). But these parcels are not in the scope of table 12 of Annex I. So with what kind of parcels is the note in No. 4.5 of table 12 dealing with?	If the scope is applied correctly, there should indeed be no instances of the zero area RP left. However, experience shows that the scope is not always complete watertight and such parcels are entering the inspection procedure. The provision is kept to facilitate a "back-up safety" to prevent these unintended parcels to bias the QE calculations (and thus support appropriate conclusions and remedial actions)

45.1.2 Annex II

Q	MS	Issue / reference	MS question / remark	JRC Reply
1	DE	Annex II	Four-eye control: Documentation and reporting of this four-eye control are still unclear. Will there be an xml-file, with data on this control for every single ETS-RP or will there be only a general reporting, that the four-eye control has been done on all the ETS RPs?	It is a general report. The four-eye control and the orthoimage quality checks (recently introduced in Annex II) is reported as "Non-structured evidence upload 2012". There will be no XML additions or modifications in the current ETS reporting package with respect to these "meta-quality" measures. Chapter 3.1 of Annex II provides the content of the meta-quality record.
2	DK	Annex II	Can we use a clear crop boundary of the same land cover as a boundary to identify the LUI?	Yes. Point VI.1 of Annex II clearly states "To check if the LUI can be inspected, perform a visual verification to ascertain all reference parcel boundaries match distinctive land features or follow well identifiable limits of land cover and/or land use ."
3	BE-FL	Annex II	Is a non-measurable RP without any critical defect, containing an ineligible element, considered non-conformant?	No. A non-conformity is only possible on RP either having critical defect OR are measurable. The ineligible element causes non-conformity through contamination for measured parcels only.
5	DE	Annex II	More clarifications of the term "in tempore non suspecto"	It literally means "time without suspicion." The legal term refers to information obtained during a time when the person giving the information has nothing to lose by telling the truth. An example would be information from updates that were planned and processed before the LPIS QA control zones were known. Any time that excludes possible interference or manipulation of the LPIS results is by-default "non suspecto". By contrast,

				prioritizing an ongoing LPIS update to focus on the LPIS QA zones (or selecting zones to match a planned update) disrupts the independent time lines and invalidates the update evidence as it would bias (i.e. clean up) the ETS results. Analysis of the populations presented for the sample-preselection allows to confirm the "in tempore non-suspecto" ex-post.
15	LT	Annex II	Do we need to make field inspection for all RPs with unclear LUI?	Not at all. You need to perform field inspections only for the sequentially determined reference parcels where CAPI failed, until you reach a sufficient sample to complete the QE2. Please follow the instructions given in Field Inspection and optional field activities 2012 .
25	CZ	Annex II	Why to delineate from scratch - it creates problems that does not exist, due to interpretation problems and poor image quality.	The purpose of the ETS is to verify if the LIPS is fit for CAP purposes via a series of external and independent observations, NOT by "visual verifications". "Fit for purpose" is not equal to "meet the national LPIS specification". The mapping from scratch is a full part of this independent external inspection and, furthermore, allows collecting more factual data that is probably stored in the LPIS. The possible "errors" induced by the poor quality and the orthoimage or incorrect interpretation are managed through the prior orthoimage check and the "four-eye" control of the ETS inspection.
26	LU	Annex II	Too much work involved in field measurements.	Field Observations and Boundary inspections are fairly straightforward and discretionary. Field inspections are indeed labour intensive but compulsory only where it is absolutely necessary. See Release notes of LPIS QA 2012 (Version 5.2 @ 2012-06-30).

45.1.3 Annex III

Q	MS	Issue / reference	MS question / remark	JRC Reply
18	BE-WA	Annex III	What is the reason behind the User-Defined Legend Codes in EP?	User-defined codes are applied when the 10 default ETS mapping codes are not suitable for a particular land cover class (e.g. heterogenous lands or mixed cropping). The short names (two letter abbreviations) of the LCC classes are used in the ETS_measurements.gml - the vector file that stores the mapped land cover features. Using shorter names in the alphanumeric part of the GML reduce significantly the file size and facilitate the data handling.
19	BE-WA	Annex III	Do we need to put in our eligibility profile all classes given in the Template?	No. You put only those that are relevant to your territory.
43	BG	Annex III-LCCS codes	The quoted definition in Table 2 of Annex III for "Permanent pasture (self-seed)" is "Closed Medium To Tall Grassland, Single Layer; Floristic Aspect: Groups of Plant Species; LCCCode - 20439-12763-T2?". Medium To Tall implies the grass height is 1.5 - 3 m. However, in Bulgaria (and in Europe) there is no such pasture.	In the context of LCCS v.2 "Medium to Tall" grassland is the grass with height ranging from 0.3 to 3 meters. The lower limit of 0.3 meters was chosen to reflect natural grassland with dense and highly productive herbaceous vegetation typically having a height of few decimetres. In the design of LCCCode "20439-12763-T2?", the Basic Classifier B4 with a modifier B15 are used in the Boolean Formula (not shown in the EP) to express this range. Indeed, the use of the verbal expression "Medium to Tall" grassland is probably not exact in the European context, but we need to take into account the fact that LCCS is designed to accommodate the worldwide variety of land cover types, and the semantics used in LCCS are in line with its global context. In any case the definition of this natural grassland class is meant to be rather general. As explained in point 8 of Annex III, EU MS are free to suggest and adopt more specific LC classes, if they found that those given in Table 2. Are not detailed enough. The LCC code for Medium To Low natural grassland (0.03 - 1.5 m) would be 20439-T2(1)[Z201] (Permanent pasture (self-seed) with grass height between 0.03 - 1.5 m).
44	BG	Annex III-LCCS codes	Which is the correct code for Permanent pasture (sown) - 11512-S0701 or 10822-S0701?	Both codes that relates to sown grassland are equally correct. The stand-alone class for sown grassland defines a single perennial rainfed graminoid herbaceous crop continuously covering the area . The mixed class self-seed/sown grassland was specifically designed for those cases when the interpreter is not certain about the type of grassland he is assessing. In such case, the classifiers "single" and "continuous" are omitted from the second class component, to reflect "mixed" nature of the class from CAPI point of view.
45	BG	Annex III-LCCS codes	Could you explain more in detail the meaning of "field margin" as given in Table 2 of annex III?	The "field margin" concept expressed in the referenced paper "Field margins in northern Europe: their functions and interactions with agriculture" is not the same as the concept used in the ETS. The field margin in the paper is clearly a composite of different land cover elements that form a single functional unit serving certain environment and land use-related purposes. The classes listed in the eligibility provide aimed to be purely land cover based, and although the definition of the landscape features might imply the introduction of land-use connotations, the provisional list in Table 2 offers a set of landscape features expressed through simple homogeneous land cover types. For that reason in Annex III, there are different entries for hedges, stone walls or ditches, grass strips - all of them, individual components of the functionally defined "field margin", as expressed in the references paper.

45.1.4 Reporting

Q	MS	Issue / reference	MS question / remark	JRC Reply
6	DE	Reporting	When updating the ETS RP according to No 2.2.13 of the important notes in Annex II the ETS inspection can be conducted by using the updated polygons. It seems to be unclear what to report in this case in the gml-file "LPIS polygon zero state" (previous or updated polygon?). Must there be a special indication, that such an updated RP is used for ETS inspection?	The updated polygon should be reported in the LPIS Polygon zero state.gml. The indication that the RP has been updated prior to the ETS would be given through the information stored in the non-structured evidence upload.

8	DE	Reporting	It should not be necessary, to indicate scores of the last year in the assessment report. IT-programming will be more complicated and expensive, when data of two years must be considered.	The introduction of the assessment report template has not affected the scoreboard.xml, so we're do not see how this affects the IT programming or raises the costs. We understand it has to be manually looked up from the previous year's document, but it serves the "effect of actions" fields, improving the readability of the combined document.
27	DE	Reporting	What is the rationale for the metadata in the reporting package?	It is a compulsory element required by ISO 19157. It can be considered as the metadata for the assessment report and also enables "assessment through usability" for that report (rather than an assessment on scores).
31	MT	Reporting	Support for GML / XML - what will do without it?	JRC is not a software developer nor a service provider for the Member States. As always we will consider requests on a case by case basis.
37	PT	Reporting	Could we provide non-CwRS imagery in MrSID?	Although MrSID is a well-known format for image compression, it is not one of the image formats accepted for non-CwRS upload as we haven't yet assessed the usability of the MrSID with respect to data quality and preservation of the initial image detail in the LPIS QA context.
38	PT	Reporting	We are using the CwRS image data, but are producing a separate set of orthoimagery solely used for LPIS QA. How we deliver such data?	Deliver as non-CwRSimage data. Please follow http://marswiki.jrc.ec.europa.eu/wikicap/index.php/LPISQA2012_2.c.i
46	BE-WA	Reporting	Do we need to provide information in the field "referenceAreaEtsIncomparable" for all reference parcels in the LpisPolygonZeroState.gml (including also those in the 100 meter buffer)?	Yes. Flag the field "referenceAreaEtsIncomparable" as TRUE in each case where you have recorded evidence from your LPIS update process that the reference area, as recorded in the LPIS, was established on means other than GPS/CAPI area delineation or mapping.
47	EE	Reporting	In case we skip LPIS QA zone, how do we indicate it in SamplePreselectionStatus xml data?	Skip the reference parcels that are in the discarded zone and use the feasibility code T2 (parcel is partially or fully not covered by image). Additionally, document your justification for the discarding of the zone via the Non-structured evidence upload. Do not report the discarded zone in the OrthoimagerySet.xml <i>terminology: please skip parcels and discard zones</i>

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46 Findings from the 2012 LPIS WS - Malta

version 5.2

NEW ARTICLE

46.1 Observations from the European Commission services

46.1.1 Wrap-up of issues by the JRC

LPIS QA seems to work as self-assessment and formally confirms what MS already knew about their system

During the workshop Member States expressed:

- the desire for a clear and stable ETS 2012 methodology;
 1. without changes late in the assessment period,
 2. with more clarifications and illustrations.
- a request to review of the LPIS update data flow,
 1. clarifying the 3 year refresh cycle
 2. including clarifications and accommodating boundary stability (provisionally phrased as boundary delineation margin by NL) based on survey and measurement limitations.
- a call for clear and stable requirements for the post-2014 LPIS,
 1. esp. on greening (grasslands delineation, EFA elements esp. landscape features)
 2. including a strategy on the required changes to the reference parcel design (note: need to update LCM/ATS)
- the perception that the LPIS QA should more accommodate for the specificities linked to the different reference parcel design options, in particular
 1. measurability issues for cadastral parcel designs
 2. multi-parcel defects for physical and topographical block designs

46.1.2 Comments by DGAgri J3

- the MS concerns about results and their interpretation are noted
- scoreboard and assessment will be considered together with the scoreboard, still the EC wants also a tool for comparison between MS

46.1.3 Comments by DGAgri D1

- the concerns of the Member States on the implementation of the 2014 reform are noted, the EC is aware of the time and resource limitations and the challenges for implementing all changes.
- the EC will provide more guidance on the expectations for LPIS update and refresh (as promised in the 2010 LPIS workshop)

46.2 Issues mentioned during the session as recorded by JRC

MS	ETS v5.2 methodology	interpreting the LPIS scores and results	post-2014 CAP consequences for LPIS	Other
DK	the 4 eye control seems cumbersome	There are a lot of registrations required	Hard to implement - new elements to measure and the 2013 resources are not yet budgeted	LPIS QA is self-assessment tool - J3 should be aware that remedial actions need time to be implemented
HU	provide open source tools for reading results, multi-parcel issue is clarified, not number of AP but units of management, not measurable block - specific issues for physical blocks,	4-eye control and strict QC is already implemented in HU, many ETS conforming blocks are not so for the internal quality control.	foresees a big problem with what is permanent pasture (how to control 5-years back, start in 2004? , what images to use; the old orthophoto; what about small parcels?	
EE	no particular statements - ETS is improved. It would be nice to stay stable henceforth	about quality assessment result - we would like to have faster feedback from EC on the performance, before the beginning of the following assessment	a/ Art 31a - problems for orthophoto planning to ensure 3--years cycle update. b/ EFA-implementation: unique landscapes require not general rules but flexible ones; 40% of EE is forest; these lands and wetlands can be also considered as EFA	
FI	glad with changes in ETS, some issues on digitizing small area. Need for a fixed version.	results - good tool for self-assessment; good to benchmark and see what other countries are doing	worries about time very short time for implementation before end 2013.	why not JRC to make one LPIS golden standard
LT	5 - meter buffer and area to zero - problems; many RPs affected, if	we don't know if we report correctly critical defect	more EC clarification needed; many things left to MS to decide; we need notes from	

	unclear all areas to zero - do we need to make still field inspection		EC. permanent pasture is important to know what does it mean? clarification more quickly. how to explain new rules to farmers?	
NL	some clarification on measurability and inspection; more examples; more general level illustrations; less complexity	stepping stone for improving LPIS quality; not to focus on scoreboard, but on remedial action plans, if not PA will perform it bias toward political way, but DG agri understood this	what type of RP is best for CAP 2014? If EC and JRC cannot give guidance, everybody is on their own? If MS decide, will J3 disallow later?	a/ NL proposes a boundary delineation margin for purpose of stability of LPIS and to account for the uncertainty of the interpretation; b/ clarification of min mapping scale
SE	no major changes unless for more simplification	good and useful tool to perform self-assessment; Results should not be against MS; J3 should look in the remedial action plan	please EC, give us clear rules!	a/ we want LPIS stability: supporting the NL proposal for boundary delineation margins if no ineligible feature inside the margin - then should be OK. b/ what about simplification?
IE	multi-parcels is an issue in IE - topographic block (many field divided by hedgerows). Revise the guidance on digitizing area <0.1 ha: in separate layers,+ not reported.	reporting XML files is complex	if all LF has to be digitized -will take too long to complete!	a/ provide templates for ArcMap b/
UK	problems with 5-meter buffer - problems. presence of non-eligible features inside the buffer for TB should be OK.	while there are weaknesses in mapping - farmers are aware of these and lodge correct applications	big concern for the incoming complexity; lots of LFs; we can only see canopy to make better judgment;	a/ supports NL proposal for boundary margin, b/ supports DK suggestion to categorize the Q&A in wikiCAP
SI	a/ welcomes to change the QE 7 and integrate OTSC and LPIS QA random sample. linear object should be extracted? - is it part of the 0.1 ha rule? area boundary margin is good	multi-polygon is concern still - we don't know whether it is right or not ? clarification of multi-polygon	Grassland should be in scope of LF counting for EFA as do LF that border to agri land without direct contact (state land restriction), Else the 7% requirement will only cause more fallow land	supports the NL proposal for boundary margin
LU	lots have been done, only problem with field measurements - too much work	When will we have the 2011 screening reports? nice to have	Simplification is missing. For the 2014 deadline, there is no always budget and staff to implement and make the IT changes	
IT	pro-rata - lack of clarity how to implement causes erroneous processing		Will cross-compliance be related to non-agriculture features / water bodies?	30/6/2012 deadline is not achievable; problems for PAS (they are in the middle of the OTSC). ETS should be performed later in campaign
DE	ETS should be stable, clear as there are lot of problems in changing. farmer update - changes from other sources in tempore non suspecto - more clarification. With a simplified assessment report template	QE6 - EC should clarify; make paper?	a/ simplification is required; b/ streamline definitions. c/ clear guidance on EFA is needed	
BE-FL	critical defects were problems in 2011; after reading 2012 - problem solved; still some reviewing of critical defects and examples needed (like multi-polygon). boundary margin	J3 explained how the result will be interpreted	there is no simplification; LF will be quite a burden; not necessary to digitize them.	a/ art 31a needs clarifications how it relates to ETS results; 3 b/ year update is not a good way; ETS is a better way
BE-WA	EP- add the reason for the user-defined legend codes + it would be better to impose xml format + why entries that not exist? VHR ortho- can we be used only partly for the sample. Tutorial in wikiCAP on XML parsing	what is the proof of a stable physical boundary for incomplete block? How to split the block to prevent multi-parcel?		
CZ	Need for training and manual for photointerpretation; quick identification of RP at risks (automated)	non-compliance criteria too strict: delineation from scratch implies virtual changes and causes	LF - tension between the original intention of LF for biodiversity and the eligibility. problems - if limited to certain sizes,	

		deviation from human factor and image quality. A study found that 35% of non-compliant are due to such error	cannot always be restricted to the size or set it up in advance	
ES	ETS should accommodate the CP. QE7 is not representative as current. Why field observations for skipped parcels? please clarify	boundary delineation is problematic for CP - ETS result may not be representative for the quality of the Spanish LPIS	worries about the impact of green payments, EFA and LF on LPIS. It should be adapted - huge economic impact.	Deadline (pre-selection 30/6/2012) is very close
MT	MS not using GNSS lack the means to vindicate critical defect.. GNSS measurement is not common. How to delineate unclear boundaries; boundary adjustment; aggregation of small parcels on an image?	QE 7 is not very representative. Very few number of matched samples.	why to put a threshold on LF: is it serving the environment purpose? habitats?	a/ Will we have the screening reports before new campaign? if screening feedback arrive later in the year and there are problems - what to do? b/ provide support for GML and XML
RO	multi-parcel - the current 10 subunit criterion is not suitable for RO; there are many such parcels in RO		worries about the workload to digitize permanent pasture and LFs	
LV	a/ 2010 was hard with GMLs - now no problems. b/ how to treat multi-parcels is not always clear		there should be no need for EFA for farmers having only permanent grassland - answer of D1 to IE	supports EE and LT about clarity and complexity. do we need to update every RP with the new data; or risk analysis?

46.3 Formal positions by the MS sent to the JRC by email

46.3.1 Malta

We hope these observations are taken in a constructive spirit and we will contribute to fine tune an already proven and efficient tool for LPIS assessment.

LPIS QA methodology

Member States who are lacking GNSS infrastructure/equipment, presently have no tool to vindicate parcel boundary critical defect ?invalid rp boundary or unmeasurable by capi?. Can JRC suggest any alternative to such method? Are the concerned MS obliged to setup such infrastructure to comply for QE3 of ETS? Does article 6(d) of 1122/2009 makes the use of such technologies obligatory? Answer from JRC or the Commission is welcome in order to build a business case in the event such infrastructure, equipment procurement and training services are needed for such a setup.

LPIS QA results

My comment on QE7 questioning that the sampling method may be based on a very restricted sample according to the current methodology, is in accordance with your mention that it is currently being considered, that the first two hundred parcels for ETS inspection would be selected from the on the spot check parcels. Would the two hundred parcels be inspected using GNSS equipment?

LPIS 2014

We do not fully support the idea that a threshold is made on the protection of landscape features. During two presentations at the workshop, it was demonstrated that both Malta and Germany have adopted such thresholds which result in confusion to the farmer. If a landscape feature is over the threshold by a few metres, this LF will no longer need protection according to this threshold and hence becomes non eligible for payment and is not protected (the farmer can remove it without sanctions applied). The Commission is requested to give some guidance on such methodologies especially in the context that in 2014, payment entitlements will have to be allocated on landscape features as these will form part of the eligible area and an important contribution to the greening element of the new CAP.

46.3.2 United Kingdom (for England, Wales, Scotland and Northern Ireland)

The Comments made from Northern Ireland, representing the whole of the UK were:

LPIS QA Methodology

- ◇ We had many RP with an unclear LUI and an ineligible feature within the 5m buffer. These could therefore not be measured.
- ◇ However, the ineligible feature was not within the unclear portion of the boundary and are therefore considered to represent a low risk to the fund.
- ◇ Therefore we feel that for topographical or physical block systems in particular, the LUI should only be classed as unclear if the ineligible feature is within 5m of the unclear portion of the RP.

LPIS QA ? Results and Interpretation

- Northern Ireland is in the middle of a LPIS refresh and therefore did not perform as well as we would have liked in some of the LPIS QA Quality Elements.
 - ◇ However if we compared the observed eligible area found during the QA to the area that was used by the farmer to activate a claim, we would have performed well.

- ◇ This means that our comprehensive media/training campaign has ensured that farmers recognise the weaknesses within the maps and only claim for the correct eligible area.
- ◇ We feel that some recognition should be given to this in the QA.

LPIS 2014

- ◇ We have great concerns about having to map landscape features and feel that the effort will be disproportionate to any benefit received.
- ◇ Mapping landscape features for us will be complex. We have great lengths of hedges in particular. These hedges can be shared between farmers and are not always symmetrical meaning that it is difficult to know which farmer owns which part of the hedge.
- ◇ Also we can only see the top of the hedge canopy on the ortho image which is often many times wider than the base of the hedge.

Additional Statements

1. We support the call from the Netherlands for an agreed on-screen tolerance, based on pixel size, when mapping boundaries from an ortho. Northern Ireland is in the middle of a LPIS refresh and has spent considerable time agreeing tolerances with our contractor. A standard figure would have streamlined this process and helped to ensure that we were compliant.
2. We support the request by Denmark to group Member States Q&A on Wikicap according to subject matter as this will make it much easier to find relevant information.

46.3.3 Czech Republic

LPIS QA methodology

The requirement for independent delineation of LUI during LPIS QA leads to many cases when the parcel is classified as NON-COMPLIANT despite the fact that there is no change in the countryside and the RP boundary has been correctly photo interpreted. This is mainly caused by differences in data sources used and a human factor (this issue was also mentioned in the presentation by Jaap Kroon). We made an analysis on non-compliant RP's and about 40% of them are falling to this category due to these reasons.

LPIS QA results and interpretation

Follow-up analysis to investigate the reasons for non-conformances found during the LPIS QA 2011 was implemented in the Czech Republic in the beginning of this year. In approx. 40% of cases no error was found, the non-conformity was caused just by small differences in photo interpretation. Remaining 60% represent real errors or problems. A set of specific measures to enhance the LPIS quality has been prepared (e.g. develop detailed photo interpretation manual and arrange for specific training of staff, identify and check RP in risk of non-conformity).

LPIS 2014

It seems from the presentations relating to the implementation of Landscape features (Malta, Germany) that there is certain tension between the environmental aspect (need to protect landscape biodiversity, protect soil from erosion, etc.) and the 'eligibility' aspect (need to set up rules for the registration of landscape features in LPIS - size or percentage limitations). This issue should be addressed at the EU level in the near future.

46.3.4 The Netherlands

LPIS QA methodology

We still need more clarification on the measurability of the LUI. What are the (exact) criteria for measurability? More examples are needed, maybe specified for the different types of RP's.
More in general: Do not make the ETS more complex and detailed as it is now. I am afraid that MS will not be able to follow all intentions and instructions.

LPIS QA results and interpretation

If we want the LPIS QA to be the stepping stone to assess the Quality of the LPIS with the aim to improve the quality of the LPIS we should not focus only on the numbers in the Ets scoreboard. The assessment and the remedial actions taken are the important aspects of the LPIS QA. If the focus from the EC lies only on the numbers in the ETS scoreboard this will stimulate the PA's to perform the ETS in a political way with the aim to bend the outcomes into the thresholds set. The presentation by Daniel Amoros Pascual of DGAgri J3 gave some reassurance that this is understood by DGAgri.

LPIS 2014

I intended to ask here the question of which type of RP is best suited to meet the requirements for LPIS coming from the new CAP (especially the Greening) from a technical point of view. But after the presentation of Wim Devos on the possible impact of the new CAP on LPIS I am slightly worried that we will have to do without clear guidance from DGAgri and JRC. As it seems now the MS's are on their own to decide in which way they will implement the new CAP in LPIS. All MS's will come with their own interpretation on what is the best solution. The time for implementation is also very short, if not too short. The EC/JRC will come with added requirements for the LPIS with regards to the new CAP in the coming years. This will lead to findings in EC audits and in non conforming LPIS QA's for many MS's. This is not in the interests of the EC, the Paying Agencies and the farmers.

Optional statements

Boundary Delineation Margin:

For the purpose of the stability in the LPIS, that is in the interest of both farmer and PA, there is a need for a Boundary Delineation Margin (BDM). This BDM is applicable in those situations in the LPIS where there is a given uncertainty on the exact location of the boundary based on CAPI. It does not apply for evident ineligible elements at the boundary of the RP or inside the RP. The BDM should cover for the uncertainty that is influenced by:

- ◇ The quality of the orthoimages
- ◇ The delineation by the operator
- ◇ The interpretation by the operator

Write the BDM in the EU regulation, for example instead of the minimum mapping scale of 1:5.000.

46.3.5 Hungary

LPIS QA Methodology

Please correct our statement into:

"Multi-parcel issue is clarified = not number of AP but units of reference parcels, not measurable block - specific issues for physical blocks"

LPIS QA results and interpretation

That ETS conforming blocks are not-conforming for the internal quality control is because there is still a difference between the ETS conformity and non-conformity from the procedure of the internal QC which stems from special landscape and LPIS management. Further studies and analysis should be done in such cases

LPIS 2014

We would like to add another idea:

Certain experiences of the LPIS QA studies and activities should give a strong support for the technical decisions of implementing the CAP reform.

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48 Abbreviations 2012

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Abbr.	Meaning of the Abbreviation
ADQR	Aggregated Data Quality Results
AEM	Agro-Environmental Measures
ATS	Model Test Suite (formerly Abstract Test Suite)
AQL	Acceptance Quality Limit
CAP	Common Agricultural Policy
CAPI	Computer Assisted Photo Interpretation
CwRS	Control with Remote Sensing
EC	European Commission
EPSG	European Petroleum Survey Group
ETS	Executable Tests Suite
EU	European Union
GAC	Good Agricultural Condition
GAEC	Good Agricultural and Environmental Condition
GI	GeoInformation
GML	Geography Markup Language
IACS	Integrated Administration and Control System
INSPIRE	Infrastructure for Spatial Information in Europe
ISO	International Organisation for Standardisation
IUT	Implementation Under Test
JRC	Joint Research Centre
LADM	Land Administration Domain Model
LCM	LPIS Core Model
LCML	Land Cover Meta Language
LCCS	Land Cover Classification System
LPIS	Land Parcel Information System
LQ	Limiting Quality
LUI	Land Under Inspection
LUHG	Land Under Historical GAC
MS	Member State
OTSC	On-the-Spot Check
RP	Reference Parcel
QC	Quality Control
QA	Quality Assurance
QAF	Quality Assurance Framework
QEx	quality element x (x = rank in the discussion document)
SDI	Spatial Data Infrastructure
SMR	Statutory Management Requirements
UML	Unified Modelling Language
VHR	Very High Resolution
XML	eXtensible Markup Language

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version 5.2

Abstract Test Suite (ATS) - set of abstract tests specifying all the requirements to be satisfied for conformance abstract test generalized test for a particular requirement

NOTE An abstract test case is a formal basis for deriving executable test cases. One or more test purposes are encapsulated in the abstract test case. An abstract test case is independent of both the implementation and the values. It should be complete in the sense that it is sufficient to enable a test verdict to be assigned unambiguously to each potentially observable test outcome (i.e. sequence of test events).

anomaly - observed non-conformance

application schema - conceptual schema for data required for one or more applications [ISO19101]

acceptance quality limit (AQL) - quality level that is the worst tolerable process average when a continuing series of lots is submitted for acceptance sampling

area ?directly comparable? (in the context of the ETS) - the eligible area observed during the ETS and the recorded reference area for a given reference parcel, are directly comparable.

NOTE In the ETS, the quantification of the maximum amount of agriculture land is made through GPS/CAPI area delineation (mapping) of the cover found on the land represented by the reference parcel (LUI). The reference area value, in other hand, can be calculated on the base of different methods/tools (for example, use of scorecards or reduction coefficients applied at individual reference parcel).

Aobs - The total agriculture (eligible) area obtained from delineation and/or estimation inside the LUI during the ETS. The field ?RP_MEA? in the EtsObservations.xml stores the value of Aobs.

Arec - The reference area of the Reference Parcel, as recorded in the LPIS. The corresponding attribute "referenceArea" of the LPIS Core Model, holds the officially known area of reference parcel, which caps the maximum area that can be declared for this reference parcel. The field ?referenceArea? in the LpisPointZeroState.gml and the LpisPolygonZeroState.gml stores the value of the Arec.

basic test - initial capability test intended to identify clear cases of non-conformance

capability test - test designed to determine whether an Implementation Under Test (IUT) conforms to a particular characteristic of an International Standard as described in the test purpose

conceptual schema language ? formal language based on a conceptual formalism for the purpose of representing conceptual schema [ISO19101]. Examples: UML, EXPRESS

conformance - fulfilment of specified requirements

conformance testing - testing of a product to determine the extent to which the product is a conforming implementation

conformance test report - summary of the conformance to core elements as well as all the details of the testing that supports the given overall summary

conforming implementation - implementation which satisfies the requirements

declared area - Total area declared on the reference parcel (by all farmers) and used for further processing by Paying Agency. The field ?declaredArea ? in the LpisPolygonZeroState.gml stores the value of the declared area???. The correspondent attribute in the LPIS Core Model is "farmedArea".

defect - non-fulfilment of an intended usage requirement

executable test - specific test of an implementation to meet particular requirements NOTE Instantiation of an abstract test case with values.

Executable Test Suite (ETS) - set of executable tests

generalization ? feature association - describing inheritance relationship between feature types, where more general feature type (supertype) is result of generalization and one specialized feature type (subtype) is result of specification

feature - abstraction of real world phenomena [ISO 19101] EXAMPLE The phenomenon named ?Eiffel Tower? may be classified with other similar phenomena into a feature type ?tower?. NOTE A feature may occur as a type or an instance. Feature type or feature instance should be used when only one is meant.

feature association - relationship that links instances of one feature type with instances of the same or a different feature type

feature attribute - characteristic/properties of a feature

Feature Catalogue (FC) - catalogue containing definitions and descriptions of the feature types, feature attributes, and feature associations occurring in one or more sets of geographic data, together with any feature operations that may be applied

GAC - Good Agricultural Condition. A component of eligibility under SAPS

land cover - physical and biological cover of the earth?s surface including artificial surfaces, agriculture areas, forests, (semi-) natural areas, wetlands, water bodies

land use - territory characterised according to its current and future planned functional or socio-economic purpose (e.g. residential, industrial, commercial, agricultural, forestry, recreational)

LCCS - Land Cover Classification System, developed by FAO/UN

limiting quality (LQ) - when a lot is considered in isolation, a quality level which for the purposes of sampling inspection is limited to a low probability of acceptance

lineage - data quality overview element, which describes the history of a feature from collection and acquisition through compilation and derivation to its current form

lot of reference parcels - homogeneous population of reference parcels defined for each country/region (or LPIS),

LPIS control zone - randomly chosen control zone used for the ETS inspection, where up-to-date national orthophoto or VHR data, acquired in the frame of the CwRS, is available.

LUI - Land Under Inspection. The land represented by the Reference Parcel, according to its definition

LUHG - Land Under Historical GAC. The land which corresponds to the area under GAC at the time of the reference data, irrespective of its production status at that reference date

non-conformance - failure to fulfil one or more specified requirements

nonconformity - non-fulfilment of a specified requirement

parcel measured (in the context of the ETS) - The entire perimeter of the LUI boundary can be depicted from the ground data as all boundary features can be identified. Also, there is no uncertainty in respect to the determination of the maximum eligible area observed, due to the absence of non-agriculture features in less than 5 meters from the RP boundary. Thus, the area can be directly derived from the RP perimeter and the measurement of the agriculture area can be performed.

QC sample - the minimum number of Reference Parcels from sample pre-selection that needs to be inspected for QE 4, according to the prescribed Limiting Quality.

sample pre-selection - ordered list of reference parcels to be sequentially inspected

sample size - prescribed number of reference parcels to be tested based on ISO 2859/2-1985 (Procedure A, Limiting Quality = 2%),

spatial object - feature

specialization - association describing inheritance relationship between feature types, where a more general feature type (supertype) is result of generalization and a specialized feature type (subtype) is result of specification.

"systematic refresh" of the LPIS - verification of the state of all reference parcels followed by an update or correction where necessary.

Unified Modelling Language (UML) - open modelling standard for conceptual schema language defined and maintained by the Object Management Group.

universe of discourse ? view of the real or hypothetical world that includes everything of interest [ISO19101]

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For technical issues regarding the LPIS quality assesment:

- Wim Devos [wim.devos@jrc.ec.europa.eu] - overall coordination
- Slavko Lemajic [slavko.lemajic@jrc.ec.europa.eu] - field inspection procedure , orthoimage upload
- Agnieszka Tarko [agnieszka.tarko@jrc.ec.europa.eu] - ETS package screening
- Romuald Franielczyk [romuald.franielczyk@jrc.ec.europa.eu] - Mediawiki - LPIS QA portal - data exchange

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version 5.2

51.1 Version 5.2 @ 2012-06-30

51.1.1 General

- The key change addresses the failure of some systems to achieve a sufficient sample of measured parcels. For this reason, in those cases, the mainstream CAPI inspection has to be followed by a mandatory field inspection. The discretionary field inspection -as a voluntary complement of the CAPI inspection- is no longer supported.
 - ◊ the flow diagram has been adapted
 - ◊ the reporting of field inspections has been simplified to the delivery of a boundary inspection for the first perimeter vertex only
- The instructions on determining the area of the small ineligible inclusions inside the LUJ have been rephrased for clarification.
- Delivery of documents from orthoimagery quality control and the four eye control are included to the unstructured evidence article

These modifications have not triggered any change to the schemas. The version number ETS v5.2 is therefore kept.

51.1.2 Annex I

Table 6: the sequence of evaluation method is slightly modified

51.1.3 Annex II

The ETS workflow is revised and simplified to reflect the changes in the field inspection approach (see above). As a result, most of the introductions in the draft version of ETS 5.2, related to the optional field data collection in combination with CAPI, were removed.

51.2 Completed developments @ 2010-04-18

To finalize version 5.2, following modification were implemented

- an article regarding the "optional field activities" is introduced in chapter 2.
 1. The corresponding support pages on "Boundary Inspection" and "Field Observation" in chapter 3 were adapted
 2. Annex II was adapted
- the xsd schema for the metadata record required by ISO 19157 is added to the ETS reporting package.
- a standalone activity diagram is published

51.3 Version 5.2 @ 2012-04-02

51.3.1 Introduction

The revision to ETS v5.2 from ETS v5.1 is relatively minor as it was driven by

- correcting the errata
- addressing the recommendations from the peer review panel
- bilateral communication (Q&A) deemed relevant for improvement

This article provides a list of issues and the effects: implemented, ongoing/delayed or ignored for ETS v5.2.

Please look at the release notes of the annexes for more details on the implemented changes.

51.3.2 Changes implemented in ETSv5.2

Feasibility inspection and re-delineation should be done by different operators to ensure an independent standard dataset.

- A "four-eye control" of the inspection is introduced in ETS Annex II

Make a clear difference between description of the data quality measures, their assessment, their evaluation and the presentation of results.

- Implemented through a re-structure of the quality measures according to the guidance laid down in ISO 19157

Thus improve the internal consistency of the documentation

- A systematic revision of the WikiCAP articles and ETS Annexes is performed prior to each new release of ETS.

Where possible, provide explanation or motivation for the thresholds which are linked to the use of LPIS. Avoid confusing terminology referring to thresholds on the same quality measure. Thresholds are best presented in a separate section since they may be subject to change without needing to change other parts of the QA.

- New article added
- The concept of ""usability"" was applied leading to a structured assessment report, holding the ETS scoreboard values and their impact assessment. Moving the stand-alone scoreboard to the ETS reporting package. "

Change the term ATS in the LPIS documentation (suggestion: change it to ?Model Conformance Test?).

- Done; the abbreviation ?ATS? is held but referred to as "model test suite".

Change the term ?temporal accuracy? in the LPIS QA documentation to ?temporal quality?

- Temporal accuracy was changed to "temporal validity" in WikiCAP.

Describe the LPIS data quality measures with the components presented in ISO 19157

- Done: Annex I was upgraded

Perform a mapping of the LPIS data quality measures against the common set of data quality measures provided in the ISO 19157. Make a clear difference in the documentation between data quality measures, its evaluation and the reporting of results.

- Done: a new article was added.

Make in the LPIS QA system a clear difference between the description, evaluation and reporting of data quality (the scope of ISO 19157) and the judging of the results (the role of users, policy makers).

- Done. See previous entries.

Clarify the scoping

- LPIS QA Scoping revised in Annex I, version 5.2 on the base of Errata 2011

GAEC effects on eligibility

- Answers are already provided by DG AGRI on http://marswiki.jrc.ec.europa.eu/wikicap/index.php/GAMMA_4.d#Topic_4.3_GAEC_eligibility_js_SPS_related

QE2: refine some definitions (e.g. LUI, contamination) that seem unclear, and might lead to some ambiguity in interpreting the measures.

- Done: several refinements made and new illustration articles added

QE2: Clarification of the ?contamination? check and the use of waivers

- A new illustration article was added

QE4: provide a more detailed definition for ?multi-parcel? critical defect.

- A new illustration article was added

QE2-QE4: Provide template/guidance for unstructured evidence

- A new article was added

QE6: since a control zone?s entire area is not necessarily updated in the same year, subdivision of the set of reference parcels for this quality element might be more effective and meaningful only according to the number of years since the reference parcels were last updated.

- Done: TABLE 16: LPIS cumulative land changes (10207): Appropriate workflow is provided for those cases where the LPIS control zone is not systematically updated at once, but different parts of it are updated in different years.

QE7: Clarification on "Irregularities"

- A preamble was added to detailed instruction 4 of Annex I

Further guidance on how to report non-agriculture land cover features

- New Table 4 is added at the end of Annex III, holding the LCCS definitions of the non-agriculture types of quality measure 10105. It can be used as informative reference, in order to help the ETS operators in their interpretation work.
- Additional agriculture land cover classes are introduced in the Eligibility profile, reflecting the type of land listed in Article 34 (2b I and 2bii) of COUNCIL REGULATION (EC) No 73/2009.

51.3.3 Elements in progress / under investigation

Include the ISO 19157 descriptors of metaquality in the LPIS quality assurance system

- The template for the four-eye" control of the ETS is modelled using the concept of the metaquality element "confidence"

Review field observation (formerly known as Rapid Field Visits - RFV)

- A new illustration article is under construction > completed @ 2010-04-18

Documentation: the online documentation should refer to any further information about the different issues by a ?lookup table? similar to the function of ?index? in a textbook. This would enable the readers to find the relevant information they need, without doubt of its most recentness.

- Indexing is possible but complicated: a possible option is to use unique and hidden HTML-tags that are to be manually entered in the search box. In absence of a list of index-words, this was not implemented.

51.3.4 Elements that are not implemented / foreseen in the ETS v5.x series.

Revision of quality measures

- A substantial revision of the measures, indicators and threshold was not made for ETSv5.2

Check and if necessary correct the conformance level stated in section 3.2.1 of the discussion document and WikiCAP

- Noted, but as the discussion document is not considered technical, its revision for this was not considered appropriate for now

Investigate alternatives for obtaining a good quality standard data set, for example using finer resolution ortho-imagery coming available later in the season. Data recentness as well as image resolution and image quality should be considered in selecting the LPIS QA standard data set

- "The issues related to the orthoimagery quality are addressed in some detail over several WikiCAP LPIS QA articles which are an integral part of the formal documentation (Section 2 of LPIS QA 2011). These articles are:
 1. Considerations regarding the orthoimage specifications - http://marswiki.jrc.ec.europa.eu/wikicap/index.php/LPISQA2012_2.b.0i#Considerations_regarding_the_orthoimage_specifications
 2. Impact of the orthoimage quality on the ETS - http://marswiki.jrc.ec.europa.eu/wikicap/index.php/LPISQA2012_3.e.ii
 3. Orthoimage technical specifications for the purpose of LPIS - http://marswiki.jrc.ec.europa.eu/wikicap/index.php/Orthoimage_technical_specifications_for_the_purpose_of_LPIS
- The comprehensive visual check of the reference orthoimagery prior to the ETS was highlighted and formalized in Annex II.

No more action is foreseen at this stage for that particular issue. Information on the feasibility and availability of generic third party aerial orthos (BING/AeroGRID) ortho will be added, at a later stage.

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version 5.2

52.1 ETS observations schema updated - @2013-04-24

A version 5.2 [ETSObservations.xsd](#) schema is published. It accomodates for the changes in the non-agriculture codes from table 10105 of [Annex I](#).

- artificialSealedSurface --> artificialSealedSurfaceAndAssociatedAreas
- naturalVegetation --> scrubland
- wetland --> waterloggedVegetation

The online validator will validate against this new schema from Friday April 26th onwards. After that date, the old schema will still be supported through manual (offline) validation. Contact [Roman](#) to ask for such validation upon receipt of the "file not valid" message.

52.1.1 LPIS sample pre-selection status (example and content)- @2012-11-27

Schemas, templates and examples

ftp://mars.jrc.ec.europa.eu/lpis/schemas/examples/5_1_LpisSamplePreselectionStatus_20111027_example.xml

The Lpis Sample pre-selection status example needs to be re-interpreted or modified:

The XML element

```
?<cap:skipped occurrence="true"/> </cap:RP_FSI>  
<cap:belongsToQC_Sample>>false</cap:belongsToQC_Sample>?
```

should be read as or replaced by

```
?<cap:skipped occurrence="true"/> </cap:RP_FSI>  
<cap:belongsToQC_Sample>true</cap:belongsToQC_Sample>?.
```

content as by the ETS reporting package guidance

http://marswiki.jrc.ec.europa.eu/wikicap/index.php/Annual_ETS_reporting_2012#The_ETS_reporting_package

The ETS reporting package entry should be re-interpreted or modified:

The phrase

7. Sample pre-selection status containing a list of the inspected and skipped (with a valid reason) reference parcels

should be read as or replaced by

7. Sample pre-selection status containing a list of the inspected reference parcels, skipped (with a valid reason) reference parcels as well as the remaining, unprocessed reference parcels present in the LPIS sample pre-selection

52.1.2 corrected Assessment Report template @2012-11-08

Some minor corrections were made on the file [template_AR.doc](#):

- ◇ QE2 + QE6: decimal numbers can be entered
- ◇ QE5: values of both V1 and V2 are specified
- ◇ QE7: 4 decimals rather than 2 are allowed

52.1.3 changes implemented in the guidance articles @2012-09-27

Annual ETS reporting 2012

• [The_ETS_reporting_package](#)

The ETS reporting package should be completed with the following two entries:

12. Orthoimage metadata file, holding the information about the type and specifications of the all orthoimages (CwRS or proprietary) used in the ETS
13. Orthoimage metadata file holding information about the location of the orthoimage data and relevant access credentials

Note: Detailed explanation of the content of these two metadata files is given in [Tools 2012](#)

52.1.4 changes implemented in the support and download articles @2012-09-24

Downloads

• [Schemas, templates and examples](#)

The ETS Observations Schema needs to be re-interpreted or modified on three places to reflect the ETSv5.2 flow or the alignment with LCCS:

1. the XML element *?referenceParcelFeasibleForInspection?* should be read as or replaced by *?referenceParcelFeasibleForMeasurement?*.
2. the XML element *?naturalVegetation?* should be read as or replaced by *?scrubland?*.
3. the XML element *?wetland?* should be read as or replaced by *?waterlogged vegetation?*.

Note: The existing schema (2011-10-27) will remain valid for 2012.

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